JPRS-UMA-95-013
23 March 1995

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Central Eurasia

Military Affairs
Armeyskiy Sbornik
No 6, December 1994

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[The following are translations of selected articles from ARMEYSKIY SBORNIK, a monthly journal of the Ministry of Defense.]

Col-Gen Vorobyev on Armed Forces Financial Problems

95UM0194A Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 2-6

[Interview with Colonel General Vasiliy Vasilyevich Vorobyev, chief of Russian Federation Ministry of Defense Main Military Budget and Finance Directorate, by ARMEYSKIY SBORNIK correspondent and science editor Colonel (Reserve) Rafeat Chekmarev, date, place and occasion not specified, under rubric "Pertinent Interview": "Finances and the Army: The Range of Problems Is Not Narrowing..."; photograph of Vorobyev included]

[FBIS Translated Text]

Calling Card

Colonel General Vorobyev was born 11 May 1946 in the settlement of Gidrotorf, Balakhninskiy Rayon, Gorkiy Oblast. He completed Yaroslavl Military School imeni General of the Army A. V. Khrulev in 1966 and the Moscow Finance Institute Military Faculty in 1974.

He held various positions in the troops in succession: chief of finance service of a battalion, regiment, division, army and military district (Siberian Military District, Southern Group of Forces, Ural Military District and Far East Military District).

He has been on the Ministry of Defense central staff since June 1990, initially as first deputy chief and then chief of a main directorate.

He is married and has two grown-up children.

Colonel General Vasiliy Vasilyevich Vorobyev, chief of Russian Federation Ministry of Defense Main Military Budget and Finance Directorate, responds to questions from an ARMEYSKIY SBORNIK correspondent.

[AS] Vasiliy Vasilyevich, I had occasion to interview you about a year ago, and I recall we began the conversation by examining the situation which had taken shape in the Russian Federation Armed Forces at that time and the most difficult problems which the military leadership had occasion to encounter... Long months have gone by, but the problems evidently have not diminished? In your view, as of today which ones are the most acute and demand urgent resolution?

[Vorobyev] Yes, I remember that last time we spoke about ways of implementing Russia's fundamental laws included in the so-called "military package." I consider it my duty to report, to my great regret, that no serious movement occurred from this standpoint. Even those laws which were adopted have not had the proper return, since the mechanism for their realization was not completely adjusted, basically due to an absence of funds (poor economic situation). Hence the existence of many problems... This has an extremely negative effect on the moral and psychological climate in military collectives and creates certain difficulties in manning the Russian Armed Forces with highly qualified cadres, in performing missions of combat training of troops and naval forces, and in giving them logistic support.

Many concerns also have been added in connection with the removal of our units from the territory of the FRG, other Eastern European states, Mongolia and former USSR republics ahead of schedule and getting hundreds of thousands of officers, warrant officers and enlisted personnel settled at new permanent locations. As before, we are experiencing many difficulties in fulfilling questions of social protection of servicemen and Armed Forces civilian personnel. Russia's peacemaking activity is "eating up" many monetary resources. And what amounts are being taken by the upkeep of all kinds of installations and structures necessary not only for the Army and Navy, but also for the entire country! But for some reason, a faulty practice has formed: expenditures for these purposes are covered only from a military budget that is shrinking like shagreen.

By the way, in a recent interview with a KRASNAYA ZVEZDA correspondent I remarked that on the whole the military budget today has a clear-cut social direction. In fact—and not everyone knows this—expenditures for pay and allowances, wages, pensions, housing construction, food, and upkeep of hospitals, polyclinics, schools, kindergartens and so on make up over 60 percent of all military expenditures. Is it really permissible to economize on something here?

[AS] Insofar as I know, Vasiliy Vasilyevich, the State Duma Defense Committee is worried about the situation that has arisen and has attempted to help the Armed Forces more than once. For example, two emergency sessions of the Committee devoted specifically to the problem of financing the Army and Navy were held just in one previous month under the chairmanship of Sergey Yushenkov. Meanwhile—and this is very difficult to understand—limits set by the Russian Federation Ministry of Finance permit the Ministry of Defense basically to provide only pay and allowances to servicemen and wages to Armed Forces civilian personnel, while other expenditures for upkeep of troops and naval forces essentially go unfinanced. Is this really normal?

[Vorobyev] Of course not. In order to support the vital activity of military and labor collectives at least in some way, each month we are forced to direct up to 30 percent of funds which have come from the Ministry of Finance toward the personnel's meals, toward expenditures connected with upkeep of medical facilities, kindergartens and schools, and toward fuel, troop movements and upkeep of buildings and structures, to the detriment of timeliness of pay and allowances and wages... I think any sensible person will agree with me that the very existence of Army and Navy collectives simply is inconceivable without all of these "components."

In being extremely frank, I wish to communicate without fail to the numerous readers of ARMEYSKIY SBORNIK, of whose editorial board I am a member, that figures describing the present financial state of the Russian Federation Armed Forces are rather alarming. Judge for yourself: in 10 months of the current year the Ministry of Defense received (not counting servicemen's pensions) R17.2 trillion instead of the R28.2 trillion provided by law. This probably is the source of all our "troubles" of today—extremely limited financing of food and clothing support and POL deliveries, and also for many other directions determining the vital activity of troops and naval forces. Now it is no longer a secret to anyone that our Army is forced to be fed and dressed partially through emergency supplies. What the further development of this process is fraught with probably does not have to be explained?

[AS] Vasiliy Vasilyevich, we know that the Ministry of Defense debt for food, electrical energy, public utilities and so on already is figured in trillions of rubles. Because of extremely limited financing, the state of supply of aviation kerosene, for example, is less than half of the actual requirement. By the way, the fact is that annual flying time of Russian military pilots now is much less than for their American colleagues. Just what are we coming to with an attitude so disrespectful, to put it mildly, toward increasing the expertise of military pilots?!

Or take the "trick" which Moscow power engineering specialists played, and which probably stunned the entire country, by turning off electricity being supplied to the Strategic Missile Troops Central Command Post. Such an escapade can be classified as nothing other than exceeding authority and official powers: nonpayment of debts hardly can be considered a substantial reason for brazen interference in the precise functioning of the state's nuclear protection system.

[Vorobyev] The incident in fact is out of the ordinary... But it is not the first one. There already have been instances where power was disconnected for entire Strategic Missile Troops formations as "punishment" for debts, but the conflict situations were resolved in a peaceful way, so to speak. But a criminal case was instituted for the last "interference"—the missilemen's patience had come to an end.

And I wish to add to the figures you cited that district and fleet fuel reserves are below prescribed standards for current storage, and this certainly leads to a reduced level of combat training of unit and subunit personnel. The shortage of monetary resources had a negative effect on winterization of housing and barracks and hampered timely establishment of liquid boiler fuel reserves. And the most terrible thing is that as a result of this people will have to suffer from the cold for the umpteenth time...

[AS] It would appear to be illogical to leave aside a question concerning the present unhappy situation in the defense complex. In the words of Vyacheslav Mozgalev, a representative of the Ministry of Economics leadership, it is "catastrophic": defense plants are being brought to a standstill, research on new arms is not being funded, and the Ministry of Defense may not receive many modern weapon models in the foreseeable future... What could you say regarding this?

[Vorobyev] Above all I wish to note that, yes, the situation in the Russian defense industry is serious, but one also must not exaggerate here. Many enterprises are shifting to a shortened work week, sending their workers on compulsory vacations, gradually eliminating the debt for payment of wages and so on.

What else can be said if we give the situation at hand a more weighed assessment? First of all, it cannot be forgotten that there is an ongoing reduction in the Army, which causes a natural decrease in delivery requirements for armament and military equipment (abbreviation VVT), and defense industry conversion rates are lagging behind rates of reduction of the state defense order. Secondly, economic capacities today do not permit fully satisfying Ministry of Defense requirements for appropriations for these purposes. We understand this situation well and at the same time are taking steps to stabilize it in some way.

The Russian Federation President decided on an annual allocation of at least 10 percent of defense expenditures to finance RDT&E. Of course, this is not enough today. Time periods for creating many models of armament and military equipment are increasing as a result, and the Army and Navy will receive a number of the newest developments with a delay. At the same time, I wish to emphasize without fail that weapon systems on which Russia's security will depend tomorrow are being financed on a priority basis and one can hope that they will arrive in the Armed Forces within prescribed time periods.

In addition, considering the difficult situation concerning allocation of federal budget appropriations, we presently are attempting to repay Russian Federation Ministry of Defense debts to enterprises and organizations fulfilling the state defense order by using treasury bonds and treasury tax exemptions.

[AS] Now one of the "eternal" questions in our editorial mail, if you will permit me: What steps have been taken as of today to speed up getting pensions directly to military retirees in case pensions are increased?

[Vorobyev] In my view, it must be noted that with the continuous increase in prices on commodities and services and the inflation processes occurring in Russia, a solution to this problem is a very important matter, since any hitch in paying a pension in the new amount devalues it appreciably by decreasing the buying power. This is why many military commissariats were promptly equipped with personal computers by decision of the Russian Federation Ministry of Defense Main Military Budget and Finance Directorate.

What did this do? Pensions now are recomputed in 2-3 weeks with the help of personal computers, and even faster in those military commissariats with a small number of registered retirees. In addition, pension authorities of military commissariats try to arrange close working contacts with personnel of Savings Bank establishments by actively assisting them in drawing up pension payment documents.

It cannot be said that work of providing pensions is going smoothly. Unfortunately, instances where bureaucratism and callousness are manifested in the work of individual military commissariat personnel have not been eliminated entirely, and at times delays in assigning and recomputing pensions are allowed. There also are simply annoying mistakes, especially in determining pension and benefit amounts, resulting in infringement of a particular retiree's rights.

To improve the quality of work in servicing retirees, the Minister of Defense issued a directive, which already has been implemented: the majority of military commissariats and military district finance-economic directorates have been beefed up with highly qualified officers. In short, everything dependent on us is being done and will be done to strengthen the social protection of Army and Navy veterans.

[AS] Vasiliy Vasilyevich, there were many false rumors in the mass media over the bill prepared by the Ministry of Finance and submitted to the Russian Government changing existing legislation on taxation of legal and natural persons. In particular, it proposed to levy an income tax on servicemen's incomes. According to my information, this bill was not coordinated either with the Ministry of Defense or with other Russian ministries and departments in which servicemen perform duty. Possible consequences both of a social as well as of a political nature were not taken into account in preparing it... But in general, when did this privilege, which fully exempted all categories of servicemen from collection of an income tax, originate?

[Vorobyev] Exempting servicemen from taxation is traditional for the Russian Army. The 1924 and 1930 Codes of Laws on Privileges and Benefits for Servicemen and Their Families established a wide range of privileges, including the exemption of servicemen from income tax and other taxes and fees.

The privilege for servicemen's tax exemption was preserved in the 30 April 1943 publication of the Union Edict "On an Income Tax on the Population." Subsequently it was retained for some categories of servicemen (first-term and extended-term service), and a minimum of pay and allowances not liable to income tax was introduced for others, which permitted fully exempting the main categories of servicemen at the tactical echelon from collection of this tax.

To strengthen social protection of servicemen and persons discharged from military service, Russian Federation Presidential Edict No 154 of 19 February 1992 exempted all categories of servicemen from payment of income tax on incomes they were receiving in connection with performance of duties of military service. This question also was resolved in a similar manner in the Russian Federation Law of 22 January 1993 "On the Status of Servicemen."

These decisions were received very enthusiastically by servicemen and their families... As was, by the way, also the fact that a recent Ministry of Finance proposal to levy an income tax on servicemen's incomes was not supported by the majority of those present at the Government session.

[AS] By the way, I cannot at all believe that the proposed "levy" could appreciably help patch up even one of the numerous "holes" in the state budget, and the financial position of servicemen and their families would deteriorate noticeably. Please clear up this question.

[Vorobyev] It must be taken into account here that 60 percent of Army and Navy personnel are first-term servicemen who always were exempt from collection of taxes. Thus, officers, warrant officers and extended-term servicemen make up an average of only 0.4 percent of the population living in a given rayon, city and so on.

Therefore the privilege granted on the basis of the Russian Federation Law "On an Income Tax on Natural Persons" exempting servicemen from collection of that tax is very insignificant in monetary terms and cannot have a substantial effect on solving Russia's problems of today.

I agree with you that a repeal of presently existing privileges in income tax collection would worsen the financial position of servicemen and their families. Moreover, it not only might entail a new splash of difficulties in future manning of the Armed Forces, but also lead to servicemen's immediate cancellation of contracts already concluded, since one of the main conditions in concluding them with the Ministry of Defense is the guarantee of compliance with Russian Federation laws, including the Law "On the Status of Servicemen," which established basic rights, privileges and benefits for them.

[AS] Thank you, Vasiliy Vasilyevich, for information of benefit to our readers. By the way, many of them were interested in the report published in the journal's first issue about setting up an extrabudgetary social support fund in the Russian Federation Ministry of Defense Main Military Budget and Finance Directorate for Armed Forces personnel, the main objective of which is to revive the best Russian officer traditions and improve material capabilities in implementing measures for uniting military collectives and for social protection of servicemen and their families. Moreover, we were asked to tell about this important initiative in more detail, i.e., what occasioned its appearance and on what measures it is proposed to spend monetary resources of the extrabudgetary fund.

Please answer these queries, and evidently we will conclude our conversation for today with this.

[Vorobyev] Material capabilities for conducting measures to unite collectives and organize their leisure time have diminished in an atmosphere of a very severe crisis of the Russian economy, inflation, and insufficiency of appropriations being allocated from the federal budget to satisfy the needs of Army and Navy personnel.

Prices on commodities and all kinds of services, which are growing from day to day, do not allow many officers and their families to make regular visits to various officers' clubs and sports establishments and hamper the conduct of military-patriotic work.

The aggregate of these and a number of other reasons served as a unique starting point for making the decision to set up in our directorate the extrabudgetary social support fund for Russian Armed Forces personnel, using funds coming from Military Insurance Company activity. By decision of the Minister of Defense, resources of this fund will be directed to a centralized Russian Federation Ministry of Defense extrabudgetary fund for social support of personnel and to extrabudgetary funds for social support of personnel in branches of the Armed Forces, districts and groups of forces.

Now a few words about the purposes for which those resources will go. The plan is as follows: resources of the Russian Federation Ministry of Defense centralized extrabudgetary fund for social support of personnel are to be expended by decision of the Russian Minister of Defense, and assets of extrabudgetary funds for social support of personnel in branches of the Russian Federation Armed Forces, districts and groups of forces are to be expended by decision of appropriate commanders in chief or commanders for conducting military-patriotic and cultural activities on state holidays; organizing meetings with war participants and Armed Forces veterans; paying for medical treatment of servicemen and their families; providing free financial assistance to servicemen with large families and those in special need; and subsidizing public dining enterprises in various officers' clubs when they hold rest and relaxation nights, meetings and other activities involving Russian Armed Forces personnel, war participants and Army and Navy veterans.

In conclusion I wish to emphasize that the Minister of Defense required commanders in chief of branches of the Armed Forces and commanders of districts and groups of forces to ensure the sensible and very specific use of resources of the Russian Armed Forces extrabudgetary fund for social support of personnel by excluding instances of mismanagement, waste and abuse.

THE ARMY: PROBLEMS, SOLUTIONS

35th Anniversary of Establishment of Russia's Missile Shield

95UM0194B Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 7-11

[Article by Major General Vladimir Nosov, candidate of military sciences, and Colonel (Retired) Nikolay Monakhov, candidate of military sciences, professor]

[FBIS Translated Text] A Decree came out on 17 December 1959 specifying the reasons and conditions for establishing a new branch of the Armed Forces, the Strategic Missile Troops. Chief Marshal of Artillery M. I. Nedelin was appointed commander in chief. The Strategic Missile Troops Main Staff as well as a number of main and central directorates were formed on 31 December of that same year.

The decision to establish the new branch of the Armed Forces was dictated by a sharp exacerbation of the military-political situation. In the late 1950's U.S. strategists were planning to begin a war against the USSR and its allies by delivering more than 300 strikes against their territory by nuclear as well as conventional weapons, knocking out at least 85 percent of military-industrial and military installations of defense importance. In this connection America began forming strategic offensive forces, whose makeup included ground-based missiles bombers carrying nuclear weapons, and subsequently also nuclear powered submarines with ballistic missiles aboard. Great importance was attached to developing carrier strike forces.

The facts indicate that on the threshold of the 1960's an urgent task arose for our country's leaders to establish a new branch of the Armed Forces that conceded nothing to U.S. strategic offensive forces.

Logistic and technical support facilities of the Strategic Missile Troops were established in unprecedentedly short time periods. RVGK [Supreme High Command Reserve] engineer brigades, Long-Range Aviation formations and other Armed Forces units began being rearmed with strategic missile systems. When the Missile Troops were established, they became the basis of missile groupings.

Several stages can be singled out in the history of Strategic Missile Troops establishment and development which characterize qualitative changes in troop combat capabilities, connected above all with the introduction of a new generation of missile systems and with a refinement of the role and place of the Missile Troops in the Strategic Nuclear Forces. The most difficult task—creating and establishing the Strategic Missile Troops as a new branch of the Armed Forces capable of performing strategic missions of special state importance—was

accomplished in the first stage, 1959-1965. Under the leadership of Nedelin, the first commander in chief of the Strategic Missile Troops (1959-1960), and later of famous Great Patriotic War military leaders Marshal of the Soviet Union K. S. Moskalenko (1960-1962), Marshal of the Soviet Union S. S. Biryuzov (1962-1963) and Marshal of the Soviet Union N. I. Krylov (1963-1972), the first generation of missilemen displayed supreme responsibility and courage in performing a genuine exploit.

The Strategic Missile Troops became permanent readiness troops from the very beginning of their existence. Alert duty is viewed here as the supreme form of maintaining readiness and as the most important kind of activity of missile formations and units. The first Statute on Alert Duty was placed into effect in the Strategic Missile Troops in November 1960. It defined four readiness conditions, established the initial status of personnel and combat equipment for each condition, and regulated actions in shifting from one condition to another. The Statute specified the makeup and locations of alert-duty shifts.

Mastering the very sophisticated missile systems and placing them on alert duty required the mobilization of all physical and spiritual forces of personnel who joined the Missile Troops. The most difficult ordeals fell to the lot of officers, who not only had to learn new equipment, but also teach subordinates, create and unite military collectives and take part in the construction of missile installations. Many missile units were formed and organic weapons were mastered by them in remote places and under stern climatic conditions. In addition, there was not enough housing, office spaces or training facility elements. As a rule all personnel, including officers, were accommodated in tents. Despite these difficulties, work continued on establishing the missile formations and units which had been formed.

Just two and a half years after being formed, the Strategic Missile Troops were performing difficult missions of averting an American invasion of Cuban territory. By decision of the country's supreme military leadership in 1962, the General Staff developed an operation, codenamed Anadyr, to move troops and missiles to Cuba. Our troop grouping was commanded by Twice-Honored Hero of the Soviet Union General of the Army I. A. Pliyev. Lieutenant General P. B. Dankevich, Lieutenant General P. V. Akindinov and Major General L. S. Garbuz from the Strategic Missile Troops worked on his staff. Major General I. D. Statsenko was the immediate organizer of missilemen's alert duty. All were Great Patriotic War participants and more than once had performed assignments involving concealed preparation of combat operations. Under their direction ground reconnaissance of the island was performed, sites were selected for situating combat launch positions, the sites were prepared, and units and subunits were placed in a condition of readiness.

Missiles were delivered by sea. The Strategic Missile Troops had no special equipment or experience for such movements. USSR Ministry of the Maritime Fleet vessels were used. Dry-cargo ships in the Baltic and Black seas were assigned for the Strategic Missile Troops. Team personnel were transported in the holds of these vessels, which was one of the important elements of concealing the operation to deliver missile specialists to Cuba. Provisions and civilian clothing for all personnel were delivered to loading sites directly from bases and arsenals of military districts. Missile Troops Rear Services headed by Major General M. I. Ponomarev performed a great deal of logistic and technical support work.

In late September 1962 a team of officers of the Missile Troops Main Staff led by General A. S. Butskoy [Translator note: last name could be Butskiy] arrived in Cuba to check the readiness of personnel and systems for performing alert duty missions. The check showed that the missilemen were successfully coping with their missions.

The country's leadership conducted a dialogue as equals during intense talks with U.S. politicians. The Caribbean crisis, one of the most acute since World War II, managed to be resolved by peaceful means.

The first stage ended by 1965 with the creation and assumption of alert duty of intercontinental missiles (R-16, R-7 and R-9) and intermediate-range missiles (R-12 and R-14) with multiple ground and silo launchers capable of operating in remote areas and in any theater of military operations.

But the United States continued large-scale deployment of Minuteman intercontinental ballistic missiles, considerably outstripping the USSR in the number of this type of missile and in its technical readiness for launch. And in the period from 1965 through 1973 the Strategic Missile Troops were performing the grandiose and technically complex mission of placing automated, single-launch missile systems in operation and on alert duty. These systems were distinguished by high combat readiness, survivability, and accuracy of delivery to the target. They were not inferior in specifications and performance characteristics to the U.S. Minuteman, and even surpassed it in certain parameters. The Strategic Missile Troops became the main component of the country's Strategic Nuclear Forces.

The beginning of the 1970's was marked by the deployment throughout the Soviet Union's territory of powerful ICBM groupings capable of opposing the U.S. nuclear missile potential. A new type of missile with MIRV's was created in the United States to achieve superiority over the USSR, and an ABM defense system was being created simultaneously. A new stage also began in development of the Strategic Missile Troops. During 1973-1985 RS-16, RS-18 and RS-20 third-generation missile systems were created and placed on alert duty to counterbalance the United States. These missile systems were characterized by the presence of

fundamentally new engineering solutions: multiple reentry vehicles, higher technical readiness and accuracy, autonomous control system with onboard computer, high protection of missiles at launch positions, possibility of remotely retargeting missiles, and the presence of more effective means of penetrating an ABM defense. Military-strategic parity between the USSR and United States was again restored when the third-generation missile systems were placed on alert duty.

A set of missions of enormous scale and complexity was accomplished in those years: new models of strategic missile weapons were being developed and placed in operation, single-launch positions were being renovated and measures were being taken to harden missile systems. Principles of combat employment of the new weapons were being developed and introduced, and the command and control system was being upgraded simultaneously.

Meanwhile, the country's leadership repeatedly came out with new proposals for the limitation and reduction of strategic weapons (especially after 1985), but the arms race continued. The United States began to deploy the new MX missile system, which surpassed the Minuteman III ICBM sixfold in combat effectiveness. Work unfolded to create the "Strategic Defense Initiative" system, which envisaged the insertion of nuclear and other kinds of weapons into outer space and which considerably increased effectiveness in delivering strikes against our country's territory. Answering steps followed for increasing the combat might and combat readiness of the Strategic Missile Troops and the Strategic Nuclear Forces as a whole. Fourth-generation missile systems were placed in operation and on alert duty during 1985-1991 which were not inferior in combat effectiveness to western nuclear missile assets, and exceeded them in some parameters. Special importance was attached to organizing command and control and combat employment of mobile missile systems from movement routes.

It is also characteristic of this period that the leadership of both countries began to understand the hopelessness of further opposition in building up nuclear might. The Treaty Between the USSR and United States on the Elimination of Intermediate-Range and Shorter-Range Missiles was signed in 1987 and the START I Treaty on the Reduction and Limitation of Strategic Offensive Arms was signed in July 1991. The next treaty of this nature, START II, was signed in January 1993, this time between Russia and the United States.

Disintegration of the USSR in 1991 led to the formation of four groupings of Strategic Missile Troops on territories of sovereign states: Russia, Ukraine, Belarus and Kazakhstan. The Strategic Missile Troops centralized battle management system was retained. Russia's Strategic Missile Troops, which have been headed by Colonel General I. D. Sergeyev since August 1992, are the most substantial in size and order of battle.

With the significant reduction in Russian general-purpose forces, the Strategic Nuclear Forces, and Strategic Missile Troops above all, remain the primary means for ensuring Russia's military security. In this difficult period for our country, they are the ones capable of ensuring strategic stability and deterrence against the initiation of a large-scale war, and they play a deciding role in shaping the parties' treaty terms in questions of a balance of forces.

Fixed and mobile missile systems of the Strategic Missile Troops make up more than 60 percent of warheads and delivery vehicles of the Russian Armed Forces Strategic Nuclear Forces and presently are capable of performing essentially all missions of a surprise retaliatory counterblow [otvetno-vstrechnyy udar]. Russia's Strategic Missile Troops continue to preserve an orderly centralized battle management system and an adjusted alert duty system, which ensures high combat readiness of troops and control over the technical condition of nuclear missile weapons. As always, the organization of measures to prevent an unsanctioned missile launch is equal to the occasion.

Difficult problems also did not bypass the missile soldiers. The shortage of materiel, the personnel understrength of many formations and units, and the absence of a sufficient amount of garrison housing all unquestionably affect the level of combat readiness and quality of performance of alert duty. Nevertheless, the majority of strategic missilemen conscientiously perform their duties and serve the homeland in an exemplary manner. Among them are Major Ye. Znamenskiy, deputy regimental commander and first class specialist, who has performed alert duty excellently for over ten years; Captain S. Melnikovich, a deputy team commander and first class specialist, who handles military equipment and weapons to perfection and skillfully educates subordinates; and Colonel V. Mazurov, unit commander and skilled methods specialist, who sees what is most important in work, delves into subordinates' needs and solves their problems.

The Strategic Missile Troops will be developed further within the framework of fulfilling START I and II treaty obligations which have been adopted. Main efforts of missile formations and units will be aimed at being ready for surprise retaliatory and retaliatory operations through the balanced development of fixed and mobile missile systems and the battle management system. A large role will be given to measures for ensuring nuclear and ecologic safety. Creation of a strategic missile grouping that meets the new conditions of the world military-political situation and that takes into account the real degree of military danger to Russia has been made the basis of Strategic Missile Troops organizational development. The numerical strength and structure of the grouping will conform to missions being assigned to it, to the country's economic capacities and to treaties concluded on limiting and reducing offensive arms.

It is planned to reform and develop the Strategic Missile Troops within the system of Russian Armed Forces modern organizational development in stages:

- up to 1996 to disband (possibly partially redeploy onto Russian territory) a number of missile units from the near abroad and simultaneously to upgrade the table of organization structure of troops and begin work on reequipping fixed missile systems with single-warhead missiles;
- during 1996-2000 to create the basis of a Strategic Missile Troops grouping outfitted with missiles with single-warhead reentry vehicles based on the existing mobile missile system and its fixed modification, to complete the elimination of missile units in the near abroad and completely fulfill measures to reduce the grouping in accordance with the START I Treaty;
- up to 2003 to completely eliminate multiple-warhead missile systems in accordance with the START II Treaty.

Plans for Strategic Missile Troops development and reform naturally may be updated with consideration of military-political and economic conditions taking shape.

Thus, the Strategic Missile Troops, whose creation 35 years ago was an objective necessity under conditions of global military-political confrontation of two world systems, even today continue to fulfill the role of a guarantor of security as part of Russia's Strategic Nuclear Forces. They are capable of reacting promptly to the appearance of any threat and to perform their assigned missions.

Russian Armed Forces Ecologic Support Organizations, Activities

95UM0194C Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 16-19

[Article by Major General (Reserve) Robert Razuvanov, academician of International Academy of Sciences of Ecology and Support to Vital Activities, candidate of technical sciences, Ministry of Defense Ecologic Center, and Colonel Aleksandr Rodionov, professor, doctor of technical sciences, Military Academy of Chemical Warfare, under rubric "Military Reform: Reality and Prospects": "Facing Nature: Ecologic Support to Everyday and Combat Activity Has Become a Mandatory Russian Armed Forces Function"]

[FBIS Translated Text] *Nature and the Armed Forces. Contradictions between them are inevitable, but are they that insoluble? When wars thunder, it is first and foremost man and his habitat that suffer from the power of weapons. And in peacetime? The Army and nature continue to be in "conflict" with each other, but basically at an everyday level. True, according to certain estimates, the Army's contribution to ecologic damage is not that great, less than one percent, compared with other "monster-poisoners." Nevertheless, an understanding of the importance of this problem and realization of its deep-seated layers came to us along with military reform. People in shoulderboards seriously turned to face nature.*

It was noted at an international conference in Rio de Janeiro in 1992 that Russia is one of the ecologically "dirtiest" countries in the world. The state of its lands is critical. The concentration of noxious substances in the atmosphere of 100 large cities exceeds maximum permissible values by ten times. Around half of Russians consume drinking water that does not conform to public health standards.

The establishment of the Ecologic Policy Council under the President, of a parliamentary Ecologic Policy and Environmental Use Committee, and of a federal Ministry of Environmental Protection and Natural Resources was evidence of the seriousness of the situation. The Law "On Environmental Protection," which spelled out a set of organizational, legal, economic and educational measures called upon to facilitate the formation and strengthening of ecologic law and order on our country's territory, was adopted in December 1991.

Other normative acts also were approved—the Land Law, Law on Mineral Resources, Forest Code, Water Code and so on. They also are obligatory for fulfillment in the Armed Forces. Why? Like any other state structure, the Army has daily "contact" with nature. Classes and firings at ranges, sea deployments, aircraft flights, storage, servicing and operation of combat and transport equipment, testing of new kinds of weapons, destruction of those being reduced or that are obsolete—this is only a small list of ecologic "costs" of military activity.

Let us take Army transport for example. It has been figured that in an hour of operation any motor vehicle engine (regardless of departmental affiliation—Ed.) throws out from 60 to 120 m^3 of exhaust gases. And 10-20 times more carbon monoxide and other components dangerous to living organisms enter the atmosphere from an untuned engine.

Environmental pollution also occurs in other ways in the day-to-day life of military collectives. The main sources of trouble in garrisons are boiler rooms, consumer service establishments, purification facilities, subsidiary farms, long-standing ownerless garbage dumps and motor pool production lines. When the latter's equipment is unserviceable, an average of around 2 m^3 of water is expended and contaminated for servicing a vehicle after a run, which itself then poisons an almost 50 times greater volume of clean water.

An acute problem of air and naval bases since earliest times is a leak of petroleum products due to a negligent attitude toward their storage and use. Materials of past years' inspections repeatedly noted instances of aviation kerosene and diesel fuel being ejected all at once. It was figured in tens of tonnes. As a result, almost 100 rivers and lakes and individual sections of water areas of the Baltic, Black and Caspian seas, Sea of Azov and Barents Sea became "dead."

But the potential risk of a negative effect of existing arms on nature (and not the actual risk, as certain representatives of the "Green" movement attempt to present to a wide audience) is especially great. The arsenals of armies of many countries, including Russia, have modern missile systems, submarines and strategic bombers with nuclear warheads aboard and colossal stockpiles of toxic agents and munitions with a conventional filling. Accidents and incidents with them are fraught with serious ecologic consequences. Suffice it to recall the disasters aboard the nuclear powered submarine Komsomolets and at Far East Military District and Pacific Fleet depots.

Nevertheless, it is not legitimate to exaggerate. Who if not the Army, with its high degree of organization, its outfitting with protective and communications equipment, its transport, and its enormous scientific potential, reacted promptly and effectively to many large-scale industrial accidents and natural disasters? Therefore the most optimum strategy for the military department now is the one which determines ways of satisfying urgent needs with a minimum detriment to nature and with maximum use of its own capacities for giving it what help it can.

In order to have an agency in the Ministry of Defense responsible for implementing state policy in the environmental protection area, Russian Federation Presidential Edict of 26 March 1992 established the Directorate of Ecology and Special Means of Protection. The new Russian General Staff subunit above all handles the organization and overall direction of ecologic support of the Armed Forces. This new military term is officially defined as a set of legal, economic, social, scientific-theoretical and organizational-technical measures carried out in peace and wartime and aimed at protecting and restoring the environment in the course of activity of troops and naval forces and at creating conditions for their performance of missions under the effect of ecologically unfavorable anthropogenic and natural factors.

We will explain the essence of the innovation. The Armed Forces act as a subject which has a negative effect on the environment, and simultaneously as an object suffering from its harmful manifestations. This means both sides need a solicitous attitude toward each other, although people in shoulderboards must take on all concerns. Since that is so, it is possible also to formulate ecologic support goals—achieving ecologic safety of Armed Forces activity and protecting personnel, arms and military equipment against ecologically unfavorable anthropogenic and natural factors.

Mutual relations of Army and nature are regulated by the Concept of Ecologic Support of the Armed Forces, approved by the chief of the General Staff. It singles out eight fundamental directions (see table). The following priorities are made the basis for their realization: preservation of human life and health and of environmental cleanliness in the process of day-to-day activity; performance of combat missions in wartime with observance of international ecologic legal norms; a scientifically substantiated combination of qualitative, economic and ecologic indicators of arms, military equipment and installations; maximum adaptation of troops and naval forces for solving ecologic problems; and unconditional observance of environmental protection legislation by each serviceman.

Structure of Ecologic Support of Russian Federation Armed Forces

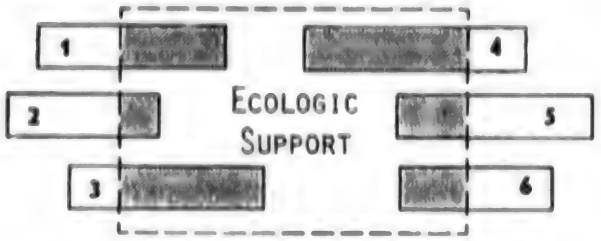
Principal Directions	Principal Missions
1. Ecologic safety of day-to-day activity of troops and naval forces	Upgrading Army ecologic entities
	Officials' compliance with state normative acts in the environmental protection area
	Ecologic certification of military installations
	Ecologic accompaniment of combat training (planning measures, monitoring their fulfillment)
	Construction, renovation, repair and maintenance of environmental protection facilities and units
	Assessment of ecologic damage inflicted

Structure of Ecologic Support of Russian Federation Armed Forces (Continued)

Principal Directions	Principal Missions
2. Ecologic protection of troops and naval forces under unfavorable anthropogenic conditions	Development of normative technical documentation on actions in extreme situations
	Organization of guaranteed protection of personnel, arms and military equipment performing missions in zones of increased risk
	Constant medical supervision of the personnel's health
	Legal and socioeconomic protection of servicemen and civilians who have suffered as a result of disasters at military installations
3. Ecologic monitoring	Creation of an automated technical foundation based on existing and future unit data control and measurement complexes and systems
	Development and introduction of unified software product and of normative and operating documentation
	Monitoring, analysis and forecasting of the ecologic situation at departmental installations
4. Restoring ecologic damage	Substantiating priority and long-term programs for bettering the environment from a health standpoint in stationing areas of troops and naval forces
	Formation of new permanent readiness units and subunits and organizational-technical ungrading of organic ones suitable for performing ecologic protection functions and mopping up in the aftermath of accidents, catastrophes and natural disasters
	Bettering the habitat from a health standpoint at installations, on posts, on assigned territories and in water areas
5. Military-scientific accompaniment	Study of the effect of military installations and military collectives on the environment
	Development of methodological foundations for assessing the ecologic situation and damage to nature
	Qualified substantiation of recommendations for reducing the negative influence on the environment and for effective restoration of damage done to it
6. Ecologic accompaniment of the life cycle of arms and military equipment, military installations, and programs for recycling nuclear, chemical and conventional weapons	Ecologic expert examination of armament and military equipment as well as military installations being operated
	Mandatory introduction of ecologic safety criteria to scientific-technical documentation on armament and military equipment models being newly created and on military installations being constructed
	Participation in forming the ecologic safety policy of programs for conversion of military production and recycling of nuclear, chemical and conventional weapons
7. Development of extradepartmental ties and international cooperation in the environmental protection area	Adjusting the interworking of Ministry of Defense ecologic entities with related state and departmental services
	Coordination of military RDT&E of an environmental protection nature with similar work of other scientific organizations
	Study, generalization and adoption of experience of environmental protection activity in foreign armies
8. Ecologic education and upbringing of personnel	Training professional cadres of military ecologists
	Universal ecologic education and upbringing of Army and Navy personnel in the combat and command training system

Some important provisions should be commented on here. What does it mean to adapt the Army and its technical equipment to perform what are at first glance missions not inherent to it? The complexity of the question lies in the fact that we must gain an understanding of the place and role of ecologic support in the comprehensive system of support to the battle (operation), which formed in the Armed Forces long ago (see diagram). Much also is accomplished in the system in peacetime, and clearly in the interests of environmental protection. For example, the Navy constantly monitors the radiation effect of nuclear powered submarines on the water area within the scope of NBC defense. And that list can be continued. Therefore, ecologic support was conceived as a uniting principle based mainly on measures of other kinds of support, which are mastered

well by the troops in the course of training and also can be fulfilled in the interests of ecology without reducing the level of combat readiness.



Hatched areas indicate the proportion of measures of an ecologic direction in the following:

Key:
1. NBC defense
2. Logistic support
3. Hydrometeorological support
4. Medical support
5. Engineer support
6. Metrologic support

Commanding generals, commanders and chiefs at all levels exercise direction of ecologic support. Its fulfillment is planned and organized by staffs of units, formations, large strategic formations, military districts and fleets. The most difficult, specific, extensive and important ecologic support missions, especially mopping up in the aftermath of accidents and disasters, are performed by personnel and assets of NBC defense troops, engineer troops and medical establishments.

But even dual-purpose Army personnel and assets will not be able to take on everything, as certain commanders and chiefs would like. The withdrawal of Russian troops from Germany and the Baltic countries acutely posed the problem of recultivation of territories being abandoned. It was necessary to set up special battalions quickly. The process of restoring lands poisoned by petroleum products is going very slowly due to the absence of effective methods and equipment. Emergency measures must be taken for burial of radioactive wastes and of reactor compartments of nuclear powered submarines. There has to be an urgent cleanup of vast fields where separating parts of booster rockets have fallen, and so on. It is our deep conviction that special ecologic agencies and units would be able to engage fully in these and other cardinal environmental protection tasks. Considering that they will not be making a direct contribution to the state's combat potential, they should be established outside of the Armed Forces numerical strength with the status of alternative service and with nonstate financing. That approach would allow showing concern for ecologic safety of the Armed Forces with enormously more success. That is first.

Secondly, being an element of day-to-day activity in peacetime, ecologic support is transformed into a kind of combat support in wartime. No one will dispute the fact that in itself war is very unecologic, even if waged only with conventional weapons, not to mention weapons of mass destruction. But on the other hand, if it is not dictated by the need to perform a combat mission or achieve success in the battle (operation), is it permissible to treat nature barbarously by doing substantial harm to man, to the flora and to the fauna?

That is just how it happened during events in the Persian Gulf, when Iraqi troops deliberately discharged oil into the sea and set fire to wells prior to departing from Kuwait. Such behavior is even more difficult to explain inasmuch as several international normative-legal acts exist, particularly the 1954 Hague Convention On Protection of Cultural Values in Wartime and the 1976 Convention on a Prohibition on Affecting the Environment in a Period of Armed Conflicts. And under such conditions the mission of military ecologists evidently will consist of helping the commander make the correct decision, guided by the criterion of justified risk. We will limit ourselves only to this discussion, although the problem of the correlation of war and ecology is enormously more complex and demands a special philosophical examination.

Just what has managed to be achieved over the past two years? The Russian Ministry of Defense Ecologic Center is accomplishing military-scientific, methods, and special mathematical and software accompaniment of ecologic support. The Central Ecologic Inspectorate; ecologic services of branches and of the Armed Forces Rear Services, and also of combat arms, districts, groups of forces, fleets and main and central directorates; and authorized and non-T/O ecologists are monitoring the status of the ecologic situation. All the named echelons will be consolidated into an automated Armed Forces ecologic monitoring system, which specialists presently are working to create.

As we see, the first steps have been taken in the direction of a solicitous attitude toward nature in the Russian Armed Forces. The rest depends only on the joint work of you and me.

Territorial Air Defense Concept Detailed

95UM0194D Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 20-22

[Letter by Colonel Aleksandr Rakhmanov, doctor of technical sciences, and Colonel Vladimir Krivoruchko, candidate of technical sciences, Russian Federation Ministry of Defense Central Scientific Research Institute 46, under rubric "A Reader Continues the Discussion": "What Heritage To Renounce"]

[FBIS Translated Text] *The article "So As Not To Leave the Sky Untended" was printed in the previous issue of the journal. Its authors, Colonel Sergey Volkov and Colonel (Reserve) Yuriy Kovtunenko, expressed their opinion concerning reform of the Air Defense Troops and their place and role in Russia's aerospace defense system.*

The article elicited an equivocal reaction, as attested by responses of our readers published below.

The air defense system which Russia inherited as a result of partition of the USSR Armed Forces retains the previous branch appearance for now. It is built by forces and assets of four branches of the Armed Forces—Air Defense Troops, Ground Troops, Air Force and Navy. It is small wonder—and in this the authors are correct—that with such an abundance of "nannies," the country's sky really can become "untended." Yes, after the withdrawal of Russian troops from countries of the near and far abroad, two branch structures, the Air Defense Troops and units of Ground Troops air defense (tactical air defense), are on the same territory, but it is very complicated to organize proper interworking between them both in peace as well as wartime. The experience of joint exercises confirmed this. It has happened where friendly aircraft were "hit" by fire of a neighboring air defense system.

The employment of air defense forces and assets of different branches in territorial air defense zones (areas) is hampered by absence of organizational and technical connection of command and control and intelligence systems. For example, "who is higher" in repelling an enemy air attack: the front air defense commanding general or the commander of air defense of the corps (division) operating within the front's operational boundaries? The presence of two structures produced an exceptionally large variety of air defense equipment and armament and complicated its system of orders and troop support.

It is therefore no accident that the concept of Russian Federation Armed Forces organizational development for 1996-2000 and for the long term up to 2005 provides for a transformation of branch air defense structures by coordinating administrative and operational command and control systems and consequently eliminating the parallelism which has formed.

We will recall that there are two opposite viewpoints today on reforming the existing air defense system. In defending the aerospace defense (VKO) system, proponents of the first viewpoint (and the authors of the aforementioned article adhere to it) exaggerate the role of air defense in deterring a potential enemy from initiating aggression. In particular they suggest that a territorial principle of its organization be embodied, preserving unified command and control of Air Defense Troops large strategic formations headed by a Main Commissariat. In their opinion, structural transformations of these troops have not been prepared either theoretically or materially for now, and upgrading of air defense should take the direction of creating an aerospace defense system including RKO [missile-space defense] and air defense forces.

Adherents of the second viewpoint suggest building a territorial air defense system based on military districts, basically subordinating it to interests of ground defense; abolishing the Air Defense Troops as a branch of the Armed Forces, with components of missile-space defense (one of the arms of Air Defense Troops) included in the Aerospace Forces or Strategic Missile Troops, and air defense aviation included in the Air Force; and transferring units of ZRV [SAM Troops] and RTV [Radiotechnical Troops] to the Ground Troops. At the same time, they believe air defense equipment and arms must be upgraded chiefly based on mobile equipment of Ground Troops air defense. Hence it follows that structural reorganization should not affect tactical air defense, since it already is built into combined-arms structures from regiment to front.

Let us try to understand how realistic and effective this path is; it can be depicted schematically as follows: RKO+PVO=VKO [missile-space defense plus air defense equals aerospace defense].

In this version the very concept of military [sic] space defense remains very controversial. The fact is, operations of missile-space defense forces are connected above all with an operation of the Strategic Nuclear Forces, which are capable of delivering a surprise retaliatory counterblow against an aggressor in a nuclear war. But joint operations of missile-space defense and air defense forces basically are planned in a strategic operation to repel an aerospace attack. Such an operation acquires meaning if its main purpose is achieved—repelling or at least weakening enemy massed nuclear missile strikes. But this goal is unattainable without creating an effective ABM defense system (of the U.S. SDI type), even with a significant mutual reduction in strategic nuclear forces. Joint employment of missile-space defense and air defense forces in a conventional war also has no practical prospects. Why? The main reason is economical. Can Russia, which today is inferior to Italy, for example, in gross domestic product, support a notoriously costly arms race in the area of creating means of aerospace attack and missile-space defense? Of course not. Therefore the RKO+PVO=VKO scheme will not "work," since it has neither economic nor operational grounds.

Here is another fundamental question: Is it necessary to preserve large strategic air defense formations such as the army and district? Inasmuch as local wars (conflicts) represent the chief danger for Russia in accordance with military doctrine, air defense forces used to repel aggression can be limited to such force elements as the air defense corps and division. Their feature is the employment of units and formations of different combat arms (SAM Troops, air defense aviation, Radiotechnical Troops) under a unified command element and with a high degree of automation and centralization of command and control and intelligence.

But with the strategic deployment of the Armed Forces envisaged by that same military doctrine, it is also impossible to exclude operational scales of operations for air defense cover of major troop groupings and important installations on the country's territory. Therefore it makes sense to have territorial large strategic

formations—air defense zones (areas)—as their new boundaries are established, coinciding where possible with the boundaries of military districts and other large strategic formations. The process can be phased, inasmuch as this will require a certain regrouping of troops. But it appears inadvisable to retain existing air defense armies as part of territorial air defense zones even in the future.

Now about the role of Ground Troops air defense formations and units in a border air defense zone (area). On the one hand they are attached to combined-arms structures by T/O&E, and on the other hand they are operationally subordinate to the command element of the territorial zone (area) and perform similar missions with the border air defense formation. Such parallelism probably is permissible in planning a strategic offensive in a theater of military operations and with full autonomy of the front air defense system, but if an offensive of that scale is not planned, then in repelling local aggression, the front (army) air defense area can remain "under the umbrella" of air defense zone forces, particularly the territorial system of fighter air cover, both in the defense as well as in the offensive.

With that apportionment, missions of the operational level of Ground Troops air defense could be performed, for example, by a mobile air defense division assigned from the zone to the front troop grouping (direct or operational subordination). It must be equipped with mobile air defense, radiotechnical, and air assets adapted to different existing branch reconnaissance and command and control systems for employment both in the territorial zone (area) and in the front air defense area. This means the tactical air defense structure can be reduced substantially. Highly mobile air defense units and possibly helicopter subunits operating on the battlefield should become its chief components. Thus, the principle of T/O&E affiliation of air defense forces with combined-arms force elements would be preserved basically only at the tactical level.

Let us focus attention once again on the key points. We believe it would be better, for economic reasons, to administratively divide missile-space defense and air defense forces while preserving their information ties; to make a phased transfer of air defense armies and corps "to the rank" of territorial large strategic formations—air defense zones (areas), whose boundaries should coincide to the maximum extent with military district boundaries; to introduce these large strategic formations to the Air Force; to retain tactical air defense formations (divisions), including radiotechnical, air defense and air units, in territorial zones; to use them in the front air defense area as they are reequipped with self-propelled equipment; to establish a unified body in the Ministry of Defense for ordering command and control automation systems, systems for automation of reconnaissance of airborne targets, and SAM armament of territorial air defense zones (areas); and, as before, to place an order through the Main Missile and Artillery Directorate for weapons of the Ground Troops tactical air defense level and of short-range air defense weapons standardized with them in other branches of the Armed Forces (including for air defense zones).

A reorganization of this nature would facilitate a radical transition from a branch to a territorial principle of building a unified Russian Federation air defense system, a significant reduction in air defense troops (forces), optimization of their structure and command and control system, and standardization of arms and equipment, and all this with minimal adjustment of the tactical air defense level and economical transformation of the operational air defense level.

That is our compromise viewpoint concerning what heritage it is advisable to renounce in Russia's air defense system and what to suggest in its place.

Unified Strategic Aerospace Defense Command Proposed

95UM0194E Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 22-23

[Letter by Major General (Retired) Petr Tushev, candidate of military sciences, docent: "Unified System-Unified Command"]

[FBIS Translated Text] Retention of the country's unified air defense system, championed by authors of the ARMEYSKIY SBORNIK article, is not just a command of the time. It was the Great Patriotic War that confirmed the need for this. Moreover, it proved that a unified command element also is needed for command and control of the Air Defense Troops.

A radical reorganization of National Air Defense was conducted in November 1941: an Air Defense Troops territorial command was established, and attached to it were all forces and assets, including fighter aviation, which was removed from the makeup of military districts in the European TVD [Theater of Military Operations]. Only questions of organization of state air defense remained under its purview in June 1942. The Air Defense Troops command element was subordinated directly to the People's Commissar of Defense, and from the summer of 1943 to the commander of Red Army Artillery.

In postwar times the Air Defense Troops were resubordinated another three times, which unfortunately appreciably complicated their command and control, which means it also substantially diminished the effectiveness of air defense as a whole. Today it seems the situation is repeating itself, and to prove the pernicious nature of such a "reform" let us return anew to Great Patriotic War experience. It was necessary to organize air defense on liberated territory in the course of our Army's strategic offensive during 1943-1944. The Air Defense Troops were chronically late in establishing such groupings. For example, National Air Defense units and

formations were only deployed around Kiev 17 days after its liberation, and around Minsk 23 days after its liberation. It was only a month after fascist German troops were encircled at Budapest and Breslau that air defense formations took these cities under cover.

The Air Defense Troops command and control system at that time had too many levels: General Staff/artillery commander's directorate/central air defense staff/air defense front/air defense formation/combat arms units. We will note also that centralized command and control of National Air Defense forces combat operations in repelling fascist air raids was exercised only at the tactical level in the Great Patriotic War. It did not exist at the operational-strategic level.

Under present conditions, repelling enemy aerospace strikes will require the immediate involvement of all command levels in command and control up to and including the strategic level. This is dictated by the regrouping of forces and assets, by their employment in air space and outer space, and by the delivery of strikes against enemy air bases and other targets supporting the operations of aerospace groupings.

Under such conditions it will be essentially impossible to divide command and control of aerospace defense forces and assets into "general" and "direct," as now is customary between the General Staff and Main Commissariat of Air Defense Troops, i.e., they will begin to duplicate each other in decisionmaking for conducting an aerospace operation, which will lead to "erosion" of responsibility for this decision.

It would appear that establishing a unified strategic aerospace defense command and investing it with General Staff powers with respect to organizing the state's aerospace defense and command and control of its forces will permit exercising command and control of operations more effectively and attaining real successes in them.

In my opinion, not only defensive, but also offensive forces, differentiated in terms of strategic aerospace directions, should become part of the aerospace defense makeup in conducting a strategic operation to repel an enemy aerospace attack. This will conform fully to the nature of Russian military doctrine and will be a factor deterring a probable enemy from initiating war.

Col-Gen Semenov on Personnel, Finance, Social Problems

95UM0194F Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) p 24

[Item from Ground Troops Press Center under rubric "News"]

[FBIS Translated Text] A regular press conference for journalists of popular periodicals, radio and television was devoted to today's problems of the Ground Troops. Their commander in chief, Colonel General V. Semenov, expressed anxiety over the fate of reforms being carried out in subordinate troops.

There are many reasons for this. The largest branch of the Armed Forces (620,000 persons according to the table of organization) is manned with a little more than half of the personnel. The fall draft did not correct the situation—units and subunits received only 9 percent of the requirement for new recruits. There is an overall understrength in drivers of 40 percent. Combat vehicles are assigned to officers in their place.

Things also are no better with officer cadres. In the current year over 4,000 persons have been discharged at their own desire due to dissatisfaction over conditions of service. In some military districts every other platoon commander is a two-year officer.

But the main trouble is the meager financing of troops' day-to-day activity, combat training and combat readiness. The debt to suppliers (for oil products, provisions, clothing, public utilities) has reached approximately R1.5 trillion. Commanders at essentially all levels have to spend around 95 percent of duty time resolving logistic support questions and settling conflict situations caused by nonpayment. Under such conditions it is more and more often necessary to turn to reserves in long-term storage.

Construction and upgrading of training facilities has been almost completely frozen. Not one division exercise has been held in the last three years. There are armies and corps where the limit is only company exercises. Compulsory flying hours in Ground Troops aviation have been lowered from 100 to 30 hours per year.

The supply of modern arms and equipment models also causes concern. Here is a typical example. New domestic Ka-50 and Mi-28 helicopters, which have received international recognition, hardly will appear in air units in the near future—there are no funds. And if matters proceed that way even further, then, as Colonel General Semenov skeptically noted, "by 2005 we will drop to the level of armies of certain African states."

Not everything is all right in the social sphere as well. The package of military laws guaranteeing specific privileges for servicemen is not being fulfilled in many points. Almost half of officer and warrant officer families are constantly hard-up and live in debt. The number of homeless also is not decreasing. In essence, the housing construction program has been curtailed and subsidies granted by the German side in connection with removal of the Western Group of Forces from the country clearly are insufficient for solving this burning problem.

Approaches which have formed of late in various power structures to paying for the labor of servicemen also cause bewilderment. Pay in the Army is 1.5-2 times below that in the Ministry of Internal Affairs, Federal Counterintelligence Service and Border Troops. And so young, promising officers depart for there, and not in pursuit of quick and easy money, but in search of a better life.

Colonel General Semenov summed up by saying that, to the honor of Ground Troops personnel, they not only are striving to "survive," but also to perform their assigned missions.

COMBAT TRAINING

SAM Battalion Intercept Officer Training

95UM0194G Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 26-28

[Article by Colonel Aleksey Rodionov, deputy chief of combat training department of a large strategic formation: "Who Will Replace the Intercept Officer?"]

[FBIS Translated Text] **Major A. Kamel was noticeably agitated on the eve of the end-of-training-period [itogovyy] field firings because young specialists for whom this was the first trip to the range had been included in the division CP team. But combat work had barely begun when his agitation subsided at once—senior lieutenants A. Titov and A. Rodionov were tracking targets precisely and confidently.**

Interference flashed on the display screens—the inspecting officer had complicated the situation. Here, too, Major Kamel preserved calm and composure. His precise, laconic commands were executed immediately by the missilemen.

The firer's confidence was transmitted to the entire CP team. Intercept officer Captain O. Shchukin functioned dependably and without interruptions, although by that time many ordeals had fallen to his lot. And it seemed that the very first missile launched predetermined the outcome of the intense duel with the airborne "enemy," but the ordeals did not end with this. There followed the inspecting officer's next narrative problem: the intercept officer had been "disabled." Who would replace him? Launch officer Senior Lieutenant Rodionov did not lose his head. He successfully snapped into action for his comrade, thereby worthily crowning the efforts of the entire team.

Without question, it is no simple matter to train equivalent replacements for leading specialists. For example, the ability to act dependably in a related specialty did not come at once to that same Senior Lieutenant Rodionov. Vexing blunders also happened in his work, especially at first, and not just for him—for others as well. But here is what is noteworthy: Major Kamel never "benched" his subordinates for mistakes. To the contrary, after critiquing the specialists' actions in detail, each time he would first strive to remedy the shortcomings, and only then would he complicate the tactical background from practice to practice.

How can one not agree here with Colonel A. Batyev, SAM regiment commander (by the way, the unit received a good evaluation for the end-of-training-period field firings), who believes that no one is insured against mistakes. In fact, will you really learn to swim by staying on shore? Aleksandr Nikolayevich himself is accustomed to proceed from life experience in everything. Say the authorized intercept officer suddenly got sick or went on leave. Who will occupy his workstation without detriment to combat readiness? Such a problem simply does not exist in the regiment. A specially trained officer (and more than one), usually the team chief, always will be found. Moreover, a kind of "cross-training school" has been established based on the SAM battalion commanded by Major Kamel, who is already familiar to us. Of course, it is not provided for in the table of organization, but it prepares worthwhile cadres. By the way, senior lieutenants Rodionov and Titov also went through it.

School training begins with a careful selection of specialists who are to master intercept officer duties. The regimental commander, his deputies and battalion commanders handle this. Naturally the question also is discussed as to what training method to choose, group or individual. Lately the preference has been given to the former because of a shortage of people. The scope is greater and equipment is used more sensibly, inasmuch as the group training plan is tied in closely with the overall class schedule in the regiment and subunits. It covers the main study topics and practical rehearsal, such as monitoring the functioning of the illuminating and missile guidance radar, drilling against simulated and actual targets and studying guidance documents and manuals. All these questions are an integral part of the regimental (battalion) combat training plan.

Before classes begin, the authorized intercept officer (most often this is Captain Shchukin, a first class specialist) acquaints trainees with the specifics of the profession which they are to master and with requirements placed on specialists of this profile, and he shares his own work and personal training experience. I will note that all this takes place directly in the control hut, where the intercept officer's workstation is located. Those present seemingly grow accustomed to the situation, become at home in it, and memorize the layout of the main controls, display screens and so on. Only then do they go on to study and rehearse problems of the topic.

I will anticipate the objection: But these are elementary things. Why talk about them? It is not novices they are teaching, it is professionals in their job. Specifically theirs... Initially even in the regiment some would grumble: We know all this as it is. Added classes, including in seemingly simple and "well studied" questions, even had to be held with such "know-it-alls" in the battalion where Senior Lieutenant V. Borisov serves. And the people realized that excessive self-confidence always is harmful, especially in mastering a new specialty.

Individuals are cross-trained further according to the classic principle of going from the simple to the complex.

Initially, for example, officers study the essence of monitoring the functioning of gear, the procedure for conducting it, possible malfunctions of gear and methods of remedying them. Then follows a practice rehearsal of these matters. Special attention is given to the quality and sequence of performing operations, or, as intercept operators say, to their "cleanness." On having mastered monitoring of the gear's functioning, trainees begin conducting it now according to the normative time by the full SAM battalion CP combat team. Thus, teamwork is achieved in the chain of firer/acquisition and target designation officer/intercept officer/launch officer/manual tracking operators.

After performing the main operations with high quality and having rehearsed the norms, trainees shift to studying the manual for the battalion CP team's combat work under various conditions and to drills on authorized simulation equipment. By this time they already have learned rather well how target blips are displayed on screens and have acquired certain work skills, including when target range and speed interference is switched on. These skills are reinforced in drills and brought to a state of automatism, as they say. And only after this are those mastering the intercept officer specialty admitted to combat work against actual targets.

The number of such drills is limited, and so they are used with a full load. In particular, coordination of team members and the intercept officer under jamming conditions is rehearsed at workstations. Nonstandard situations characteristic of modern air defense battle often are simulated. All this is tied in closely with specific missions assigned to the unit and subunit. Thus, main attention in drills and in the course of combat work is given to studying those offensive aerospace weapons of the potential enemy whose employment is most likely in the missilemen's zone of responsibility.

The very same also goes for assessing the potential enemy's operating tactics: those tactics most likely to be used by him specifically under local conditions are gone into in greatest detail. The specialists also substantiate possible retaliatory actions against the opposing side's offensive aerospace weapons. These questions are studied in more detail and depth in rehearsing subsequent missions, including tactical field fire exercises. That approach helps trainees gain a specific idea of the probable enemy's operating tactics, without which it is difficult to count on success in real battle.

It stands to reason that the group method of cross-training specialists in the regiment does not preclude, but, to the contrary, presumes their self-improvement. Additional missions and exercises for individual drills are worked out in each battalion under the direction of the commander and unit staff officers. They are chosen so that after having accumulating initial experience a trainee acting the part of an intercept operator could work them independently later without anyone's assistance. Effective mutual monitoring also has been regulated. In observing the actions of his comrade and of team members, each officer can evaluate their work and express his observations. Then overall results are summed up and grades given. The comparison of results, expressed concretely in points, permits judging who is best and who should "pull himself up."

Further, an intercept officer needs such qualities as decisiveness and independence. Of course any military professional needs them, but the one who "guides" missiles needs them doubly. This is why it is a rare practical class or drill on equipment in the regiment that gets by without narrative problems unexpected by trainees. It stands to reason that their degree of difficulty is chosen with consideration of the training level of the specialist working as the intercept officer. But one thing remains invariable: the mission which a missileman has to accomplish in a role new for him must be a bit more difficult than the one he had occasion to perform in previous classes.

Such a diverse, well-conceived training system permits a specialist to cope more confidently with the duties assigned him—perform alert duty, rehearse combat training missions, perform accurate launches at the range, and replace a "disabled" comrade at the workstation, all with quality. The end-of-training period field firings confirmed this with all obviousness.

Preparation of Platoon Defense

95UM0194H Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 29-32

[Continuation by Aleksandr Denisov and Nikolay Shishkin of article begun in VOYENNYY VESTNIK, Nos 1, 2, 4, 5, 1994 and ARMEYSKIY SBORNIK, Nos 1-5, 1994]

[FBIS Translated Text] Preparation of the defense begins on receipt of the combat mission. In organizing for battle **out of contact with the enemy,** the platoon commander first makes the decision from a map, announces it to squad (tank) commanders, takes the platoon to the indicated strongpoint or to a sheltered place on approaches to it, disposes it covertly and organizes local security. Then he performs ground reconnaissance with commanders of squads (tanks) and attached weapons; issues the operation order; and organizes coordination, the system of fire, combat support, command and control, as well as preparation of personnel, weapons and equipment for battle. An occupied strongpoint is prepared from an engineer standpoint and observation is conducted. The platoon commander creates the battle formation and system of fire, compiles a strongpoint diagram and checks readiness for battle.

In shifting to a defense **in immediate contact with the enemy,** the platoon commander may make the decision from a map (scale 1:50,000) and assign missions by radio to squads (tanks) for occupying positions. Then he organizes observation ahead of the front and on the

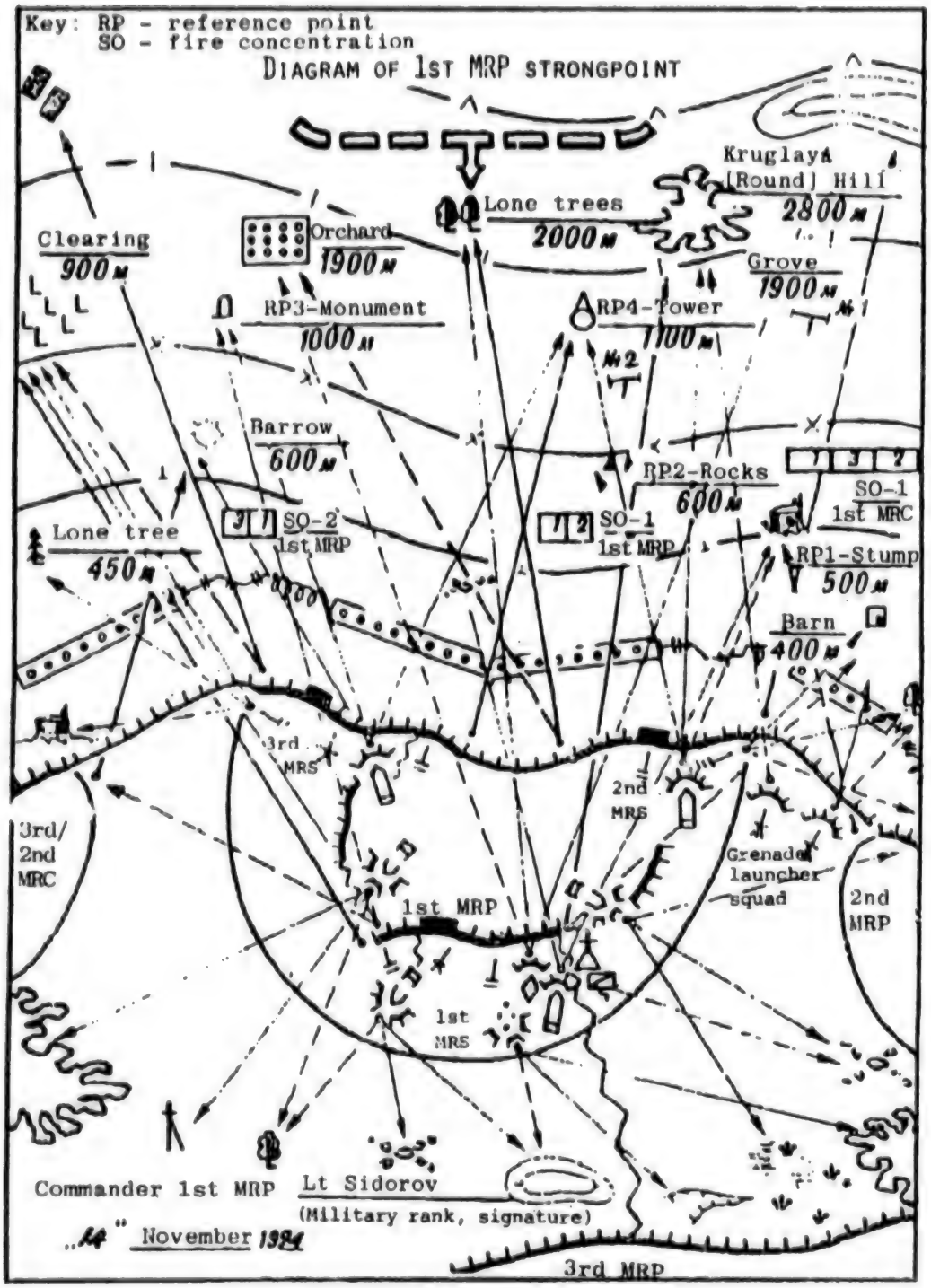


Diagram of motorized rifle platoon strongpoint (variant)

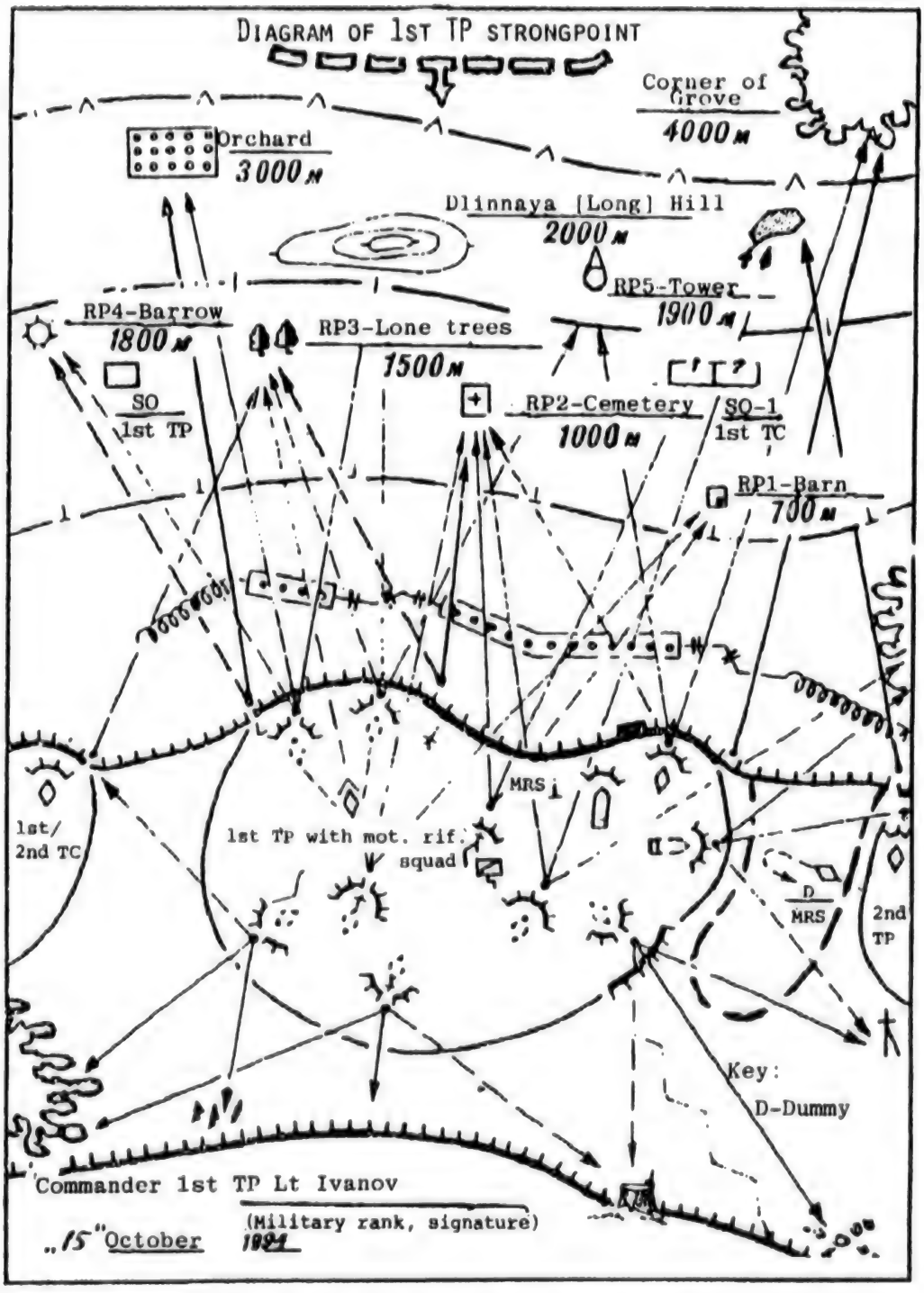


Diagram of tank platoon strongpoint (variant)

flanks, coordination, the system of fire, combat support, command and control, and engineer preparation of the strongpoint. Subsequently he studies terrain and updates missions for squads (tanks) and the coordination procedure. The platoon commander usually spends around one and a half hours organizing a defense out of contact with the enemy and no more than an hour when in immediate contact with him.

In **gaining a clear understanding of the mission,** the platoon commander must understand the company and platoon mission, find out what targets are engaged by senior commanders' weapons, missions of adjacent subunits, procedure for coordinating with them, and the readiness time.

In estimating the situation, the platoon commander successively studies the enemy, his own subunits, adjacent subunits and the nature of terrain and takes into account the state of the weather, time of year and day and their effect on preparation and conduct of the defense.

In studying the enemy, he determines his makeup, presumed nature of operations, probable axis of concentration of main efforts, lines of deployment and departure, and possible locations of weapons. Based on the data received he outlines the method for performing the mission, the battle formation, and missions for squads (tanks) and attached subunits and weapons, and he resolves the main coordination problems.

To estimate his own squads, the platoon commander clarifies their status and state of supply. Then, knowing friendly and enemy capabilities, he outlines methods of performing the mission and determines which squads (tanks) should be disposed on the axis of concentration of main efforts and methods for using means of reinforcement. He decides what kind of platoon battle formation there will be, assigns missions to squads (tanks) and establishes the sequence and time periods for maskirovka [lit. "camouflage", however, includes "concealment" and "deception"—FBIS] and engineer preparation of the strongpoint, the time for servicing and maintenance and the time for replenishing fuel and ammunition.

The **estimate of adjacent subunits** consists of studying their makeup, situation and assigned missions. It is important to agree upon efforts to cover intervals and on coordination methods. The degree of adjacent subunits' influence on the platoon's performance of the mission, necessary measures for covering flanks and intervals and the procedure for joint actions to destroy the enemy should he wedge in at boundaries with them are determined on this basis.

In estimating terrain, the platoon commander first studies it on approaches to the defense and then directly in the strongpoint. Ahead of the front it is important to determine sectors in which the enemy can concentrate covertly and his probable routes of forward movement to the FEBA and lines of deployment and departure.

In the strongpoint one should find suitable places for positions of squads (tanks) and the command-observation post and clarify the sequence of fulfilling measures for maskirovka and engineer preparation of the strongpoint and of squad (tank) positions.

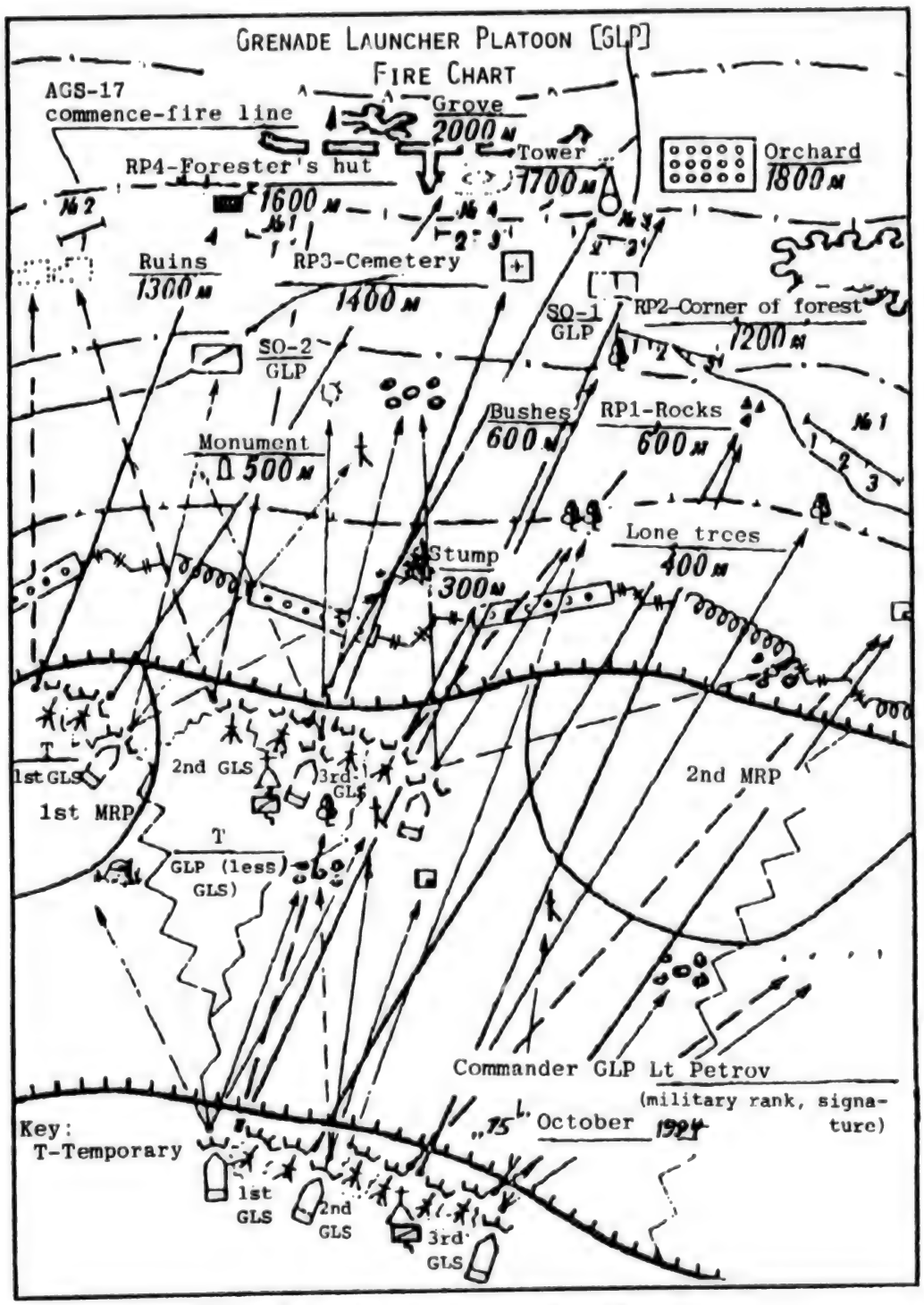
Ground reconnaissance usually is organized in the platoon after it is performed in the company. Having arrived at the work site together with the platoon commander and already knowing their missions, squad (tank) commanders can use this time to become familiar with the terrain and prepare for work.

In the course of ground reconnaissance it is important to point out to squad (tank) commanders reference points, the most probable axis of enemy attack, his possible lines of departure and directions of combat helicopter operations, trace of the FEBA, and strongpoints of adjacent platoons. After this it must be determined specifically on the terrain where positions of squads (firing positions of tanks) and attached weapons, the trench and the communication trench will be located. Clarification of zones of fire, primary and secondary sectors of fire, primary and alternate firing positions, and missions of attached weapons earmarked for securing flanks and intervals requires special attention. Knowing the protective and concealing features of the relief, it is easy to determine the sequence and time periods of engineer preparation of positions, locations for emplacement of engineer obstacles and their nature, procedure for covering them by fire and disposition of the command-observation post.

After ground reconnaissance, the platoon commander issues the operation order. In addition to reference points, information on the enemy, missions of the company, platoon and adjacent subunits, and targets to be engaged by the senior commander's assets, it indicates the missions for squads, attached weapons, sniper, and rifleman-medic; primary and alternate (temporary) firing positions; zones of fire; and primary and secondary sectors of fire. In addition, the commander specifies in the order the platoon fire concentration sectors, targets against which squads must fire, and weapons securing intervals with adjacent subunits and the flanks.

In the operation order the grenade launcher platoon and antitank platoon commanders assign missions to squads and point out their primary and alternate (temporary) firing positions, zones of fire and secondary sectors of fire. The grenade launcher platoon commander also specifies fire concentration sectors, defensive fire lines, and missions for securing intervals and flanks.

The time for occupying the defense, readiness time of the system of fire, and sequence and time periods for engineer preparation of the strongpoint are indicated in the concluding part of the operation order.



Fire chart of grenade launcher platoon (variant)

After the operation order is communicated to personnel, the platoon commander organizes **coordination** of squads (tanks) and attached weapons. In particular, he determines methods of destroying the enemy during forward movement to the FEBA and deployment for the assault (or while in the attack position). The commander also indicates lines for commencing fire from tanks, BMP's, and antitank and other weapons in repelling an assault ahead of the FEBA and in case the enemy moves to the flanks and to the rear, and the sequence of conducting concentrated fire and fire against low-flying airborne targets from BMP weapons and small arms (tank antiaircraft machineguns). He coordinates platoon actions with adjacent subunits, with tank crews and with teams of antitank and other weapons disposed in the platoon strongpoint and on the flanks for misleading the enemy regarding alignment of the platoon defense, for repelling his assaults ahead of the FEBA and for destroying him if he wedges into the defense. He designates duty weapons; determines methods for destroying enemy reconnaissance, for protection and for maskirovka; and communicates warning and control signals and the procedure for actions in response to them.

In organizing the **system of fire,** it is important to clarify the following: squad positions; their zones of fire and sectors of fire; primary and alternate (temporary) firing positions of BMP's (BTR's); and their primary and secondary sectors of fire from each position. In addition to this, it is necessary to determine specifically the platoon's fire concentration sectors (usually one or two) and targets against which squads should conduct fire; the sniper's primary and alternate firing positions; procedure for observation and conduct of fire and the commence-fire lines for all platoon weapons. Fire cover of engineer obstacles requires special attention.

The tank platoon commander clarifies primary and alternate firing positions of tanks, primary and secondary sectors of fire from each position and the platoon fire concentration sectors.

A zone of fire is indicated on the right and left by lines passing through two local features (reference points). It widens somewhat toward the enemy, ensuring an overlap with zones of fire of adjacent squads at a distance of 500-600 m from the FEBA.

Terrain within the zone of fire is broken into fire sectors of tanks, BMP's, ATGM launchers, grenade launchers, flamethrowers and machineguns. As a rule, fire sector boundaries are determined according to the field-of-vision angle of a sight in "mils" relative to a reference point.

Secondary sectors of fire are designated for individual tanks (BMP's) for covering obstacles with cross fire, and for squads for fire coordination with adjacent subunits. Sectors of fire from alternate positions must enable fire to be conducted toward the front, flanks and rear.

Combat training experience indicates that it takes 25-35 minutes to organize a platoon system of fire and to compile the strongpoint diagram, especially with formatted blanks (cards) available.

Communications in a Tactical Airborne Assault Force

95UM0194I Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 33-36

[Article by Colonel Gennadiy Trushkin]

[FBIS Translated Text] The success of modern combined-arms battle depends largely on how rapidly the advancing troops take advantage of results of air and artillery damage and casualty effect on enemy battle formations, and an important role is set aside here for tactical airborne assault forces. The experience of field training exercises and command and staff exercises has shown the rather high effectiveness of their employment.

But the specific nature of operations, such as of a motorized rifle battalion [MRB] in a tactical airborne assault force, requires consideration of a number of additional factors and dictates certain features in organizing command and control, particularly in providing communications with the tactical airborne assault force.

Thus, reinforced motorized rifle subunits operating as a tactical airborne assault force are landed most often without BMP's (BTR's). This significantly lowers their combat capabilities, including in matters of communications. True, the latter shortcoming manages to be compensated to a certain extent by attached subunits, but including means of reinforcement and support in the makeup of a tactical airborne assault force in turn makes it harder to maintain stable, uninterrupted communications. Let us turn to the experience of an exercise in order to examine in greater detail and specificity these and other features of organizing communications in a tactical airborne assault force.

An MRB, reinforced by a 122-mm howitzer battery, reconnaissance platoon, combat engineer platoon and NBC reconnaissance squad, was assigned as a tactical airborne assault force with the mission of capturing and destroying an important enemy objective, taking a road junction and holding it until the arrival of the formation's forward detachment. The landing zone was 27 km from the line of troop contact.

Assault force combat operations were supported by two flights of fighter-bombers; by artillery of first echelon units of the formation (forward detachment) when they reached lines supporting the conduct of effective fire; and by long-range artillery from the division artillery group.

To provide stable command and control in battle, the MRB commander decided to land a command and staff vehicle (BMP-1ksh), command combat vehicle (BMP-1k), combat reconnaissance vehicle (BRM-1k) and chemical reconnaissance vehicle (BRDM-2rkhb) together with the subunits. In addition, artillery and air representatives with their R-143 and R-809 radios respectively were operating with the battalion.

Command and control of the assault force was exercised from the formation command post, alternate command post and also, in individual periods of battle, from an airborne command post.

The MRB commander's communications with the formation commander and staff in the troop pickup zone was organized over wire channels by the senior commander's forces and assets and also by signaling devices and mobile equipment.

Communications of the tactical airborne assault force commander with subunit commanders was accomplished over P-274M cable. Parallel connection of several subscribers into one line was envisaged to reduce cable expenditure and shorten deployment time.

During the flight of helicopters with the assault force, communications with the battalion commander was maintained over aviation radio nets via the tactical air control party located at the formation CP.

In flight the assault force commander and subunit commanders were accommodated next to the squadron and flight commanders. This permitted them to receive commands and operational instructions and to update combat missions for subordinates through the aviators (Fig. 1).

As a rule, two radios, VHF/UHF and HF, are installed in transport aircraft used for an assault landing. Warning and tactical control signals are transmitted over the VHF/UHF helicopter tactical control radio net. Receivers at command and control facilities of friendly troops over whose battle formations the airlift route passes and at command and control facilities of artillery and air defense units providing fire cover are switched into it to obtain information on assault force movement.

Communications with fighter aircraft was accomplished via the radio of the senior commander of helicopter subunits, which operated in the fighter tactical control radio net during the airlift.

Experience shows that the most difficult and important moment in providing continuous command and control is the period when the tactical airborne assault force is debarking from helicopters and unfolding combat operations. In this phase it is advisable to exercise command and control of the assault force, attached and coordinating subunits, and supporting aircraft and artillery using radios (Fig. 2), signaling devices and mobile equipment.

Communications of the tactical airborne assault force commander with the formation commander was maintained over radio nets 201 and 202 on VHF/UHF and HF radios respectively. In addition, there was the possibility of radio communications of commanders of the assault force and formation on the R-111 when the formation commander was in the airborne command post. It should be borne in mind that the range and quality of radio communications improve considerably here, for in this case the terrain's effect on it diminishes.

If for some reason the assault force commander should lose communications with the formation commander, here too he would be able to come up in communications with the senior commander, specifically on standby radio net 305.

According to the commander's concept, an advance party consisting of a motorized rifle platoon was first to be landed. It deployed into battle formation from the move and assaulted and destroyed the enemy in the vicinity of the landing zones, supporting the landing and preparation for battle of the tactical airborne assault force main body.

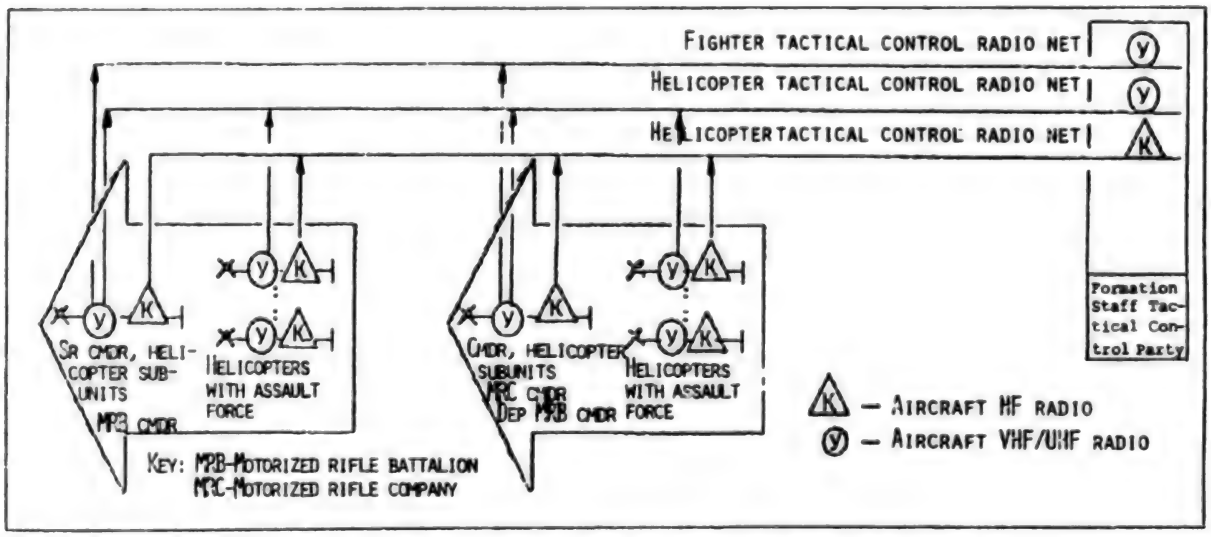


Fig. 1. Diagram of organization of communications in flight (variant)

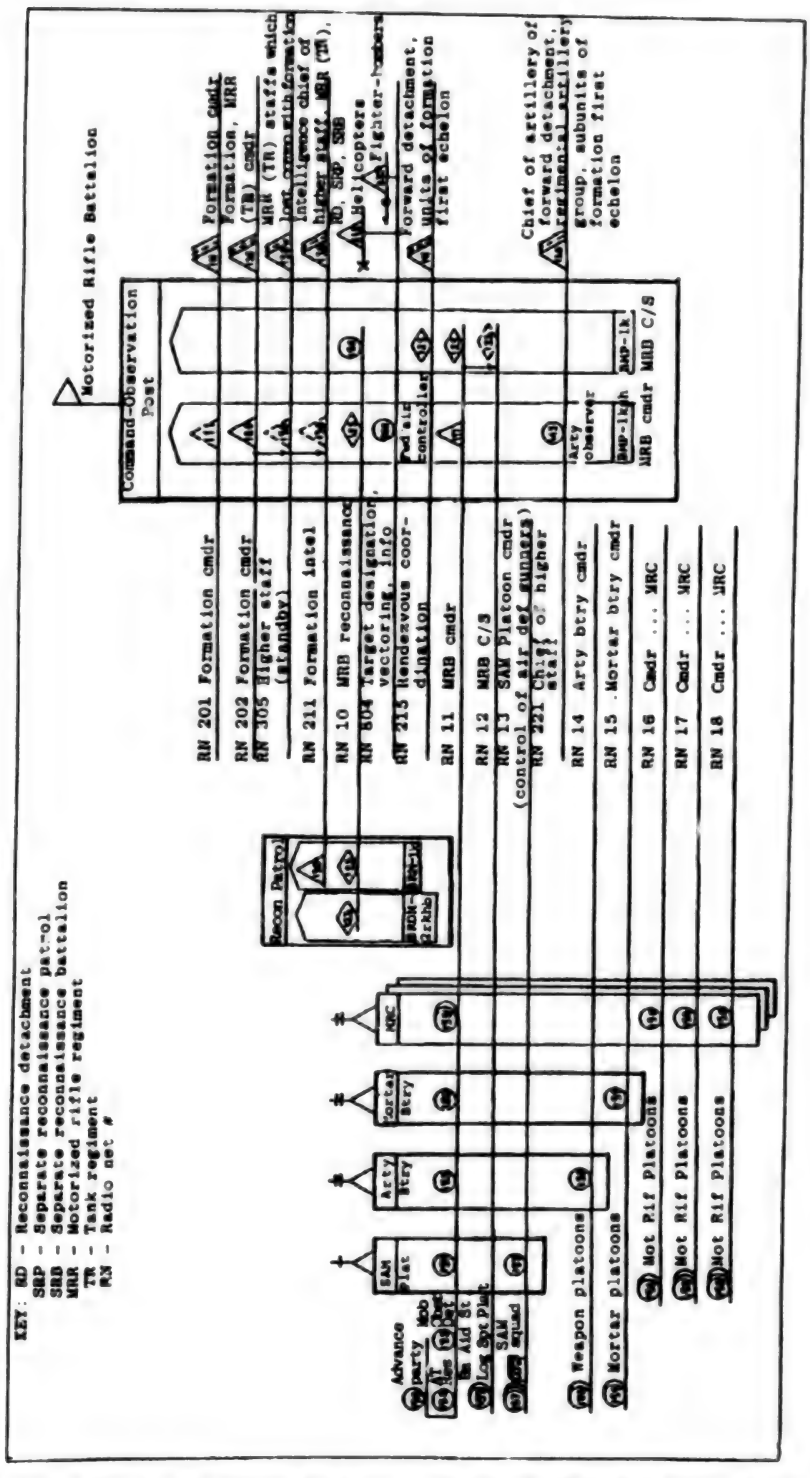


Fig. 2. Diagram of organization of radio communications of a motorized rifle battalion operating in a formation's tactical airborne assault force (variant)

Note: Numerical designations of radios, some only partially legible, have been left as in the original.

A reconnaissance platoon and NBC reconnaissance squad were landed simultaneously. Reconnaissance of the important enemy objective and the terrain was accomplished by methods of observation and sending out a reconnaissance patrol in a BRM-1k and BRDM-2rkhb. Joint actions of tactical and chemical scouts permitted discovering the necessary objective in good time and determining and transmitting its coordinates to the assault force commander over radio net 10. Radiation and chemical reconnaissance of assault force landing zones and subunit movement routes was conducted in parallel.

After the landing, communications of the MRB commander with the advance party commander was conducted over radio net 11. Radios of the battalion chief of staff and of commanders of motorized rifle companies, mortar battery, antitank battery, SAM platoon, antitank (antitank reserve) platoon and combat engineer platoon (mobile obstacle detachment) also entered this net.

Communications of company commanders with platoon commanders was supported on radio nets 16-18.

Intelligence on the enemy and on the radiation and chemical situation in the combat operations area was received by the assault force commander and chief of staff from the reconnaissance patrol commander over radio net 10. Moreover, the tactical airborne assault force had an opportunity to exchange information with the formation's reconnaissance entities over radio net 211.

Communications with supporting aircraft was accomplished through the forward air controller, who operated on target designation, vectoring and information radio net 804. He landed with his radio together with the MRB commander and was with him in the BMP-1ksh command and staff vehicle.

Since the battalion landed without BMP's, the assault force had an acute need for fire support by artillery assets. The tactical airborne assault force was given invaluable help here by artillery of the formation's forward detachment, which was advancing in the direction of assault force operations, and by the division artillery group's long-range artillery.

Coordination communications with artillery was supported over radio net 221 through a formation artillery staff representative, located with an R-143 in a BMP-1ksh.

Radio net 14 was established in the artillery battery and radio net 15 in the mortar battery.

Radio net 13 functioned for command and control of the assault force's air defense assets. R-157 radios of commanders of the SAM platoon and squads and also R-147P radio receivers of portable missile system air defense gunners were included in it.

Information for the tactical airborne assault force commander about operations of the forward detachment, first echelon motorized rifle units and the formation main body fighting their way through to the assault force was accomplished over rendezvous coordination radio net 215. The radio of the battalion chief of staff operated here constantly from a BMP-1k.

So as not to overload the MRB commander's radio net 11, it was decided to support communications with commanders of the logistic support platoon and aid station over separate radio net 12 of the battalion chief of staff.

Thus, organizing communications in an MRB operating as a tactical airborne assault force has its features in contrast to that of a battalion which is part of a motorized rifle regiment. The rather large number of attached, supporting and coordinating subunits and units presumes detailed planning and development of nonstandard decisions for organizing communications.

If the chief of communications has good knowledge of operating tactics of an MRB in a tactical airborne assault force, this will serve for him as a basis in choosing a sensible communications system, the nucleus of which is radio communications. In a specific situation and depending on capabilities of helicopters for landing communications equipment, certain radio nets, such as those of the battalion commander, reconnaissance commander, and chief of staff, may be combined. At times it is also advisable to set up additional radio nets to improve the reliability and uninterrupted nature of command and control of subunits.

Remote Control of Radio Transmitters

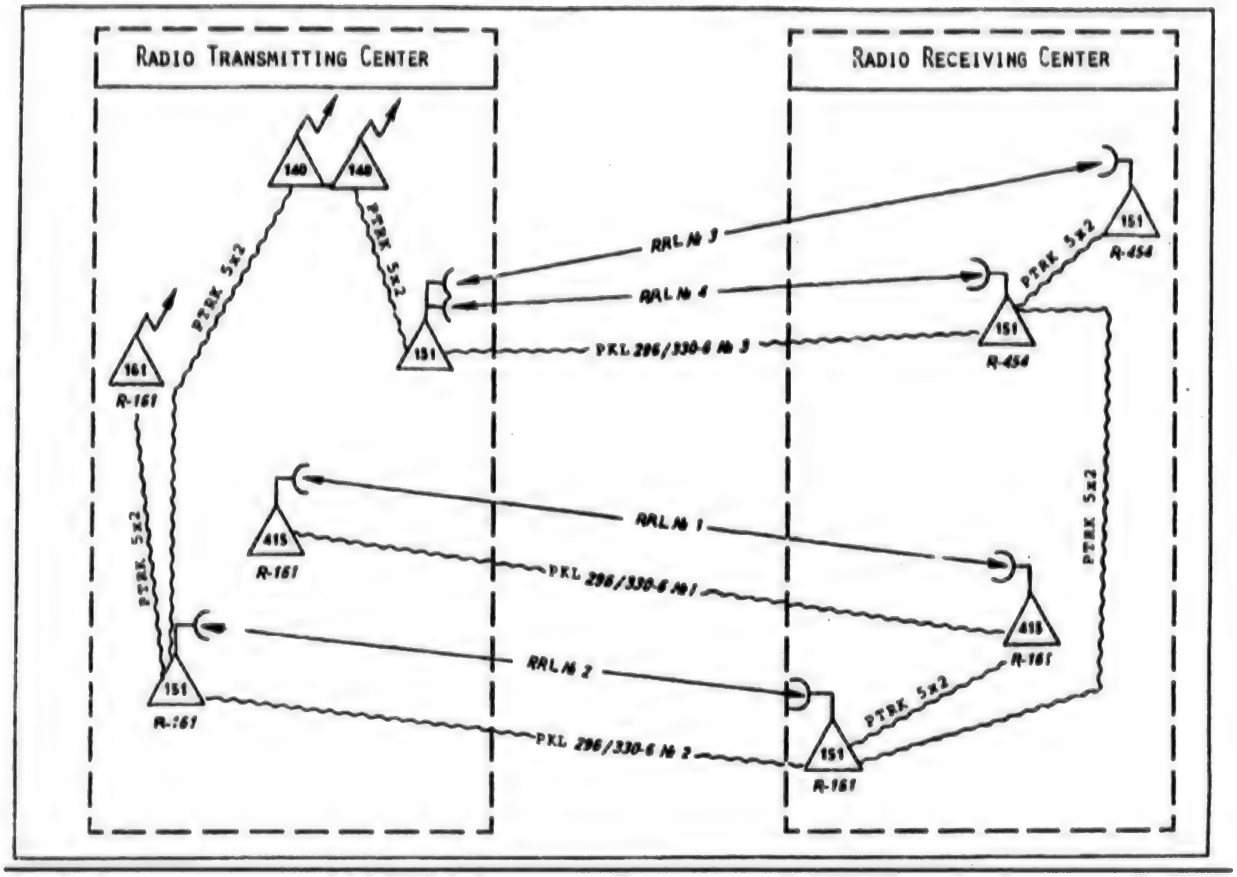
95UM0194J Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 41-42

[Article by Senior Lieutenant Oleg Malyshev, platoon commander, North Caucasus Military District, under rubric "To Assist Communicators"]

[FBIS Translated Text] Experience shows it is no simple matter to provide for remote control of medium and high power radio transmitters, for as a rule they are located several kilometers from the radio receiving center. Consequently, special communications lines are needed over which it would be possible to control high-frequency oscillations emitted by radio transmitters.

I have gained certain experience in providing remote control in performing combat training missions and wish to share it.

The platoon was assigned the following mission: By a certain time deploy a radio transmitting center 6 km from a field communications center, provide remote control of four medium-power transmitters and one high-power transmitter, initially over radio-relay lines, then transfer them to operation over cable (see diagram).



Of course, control of the transmitters could have been organized over one group radio-relay line having a rather large number of remote control channels, using the R-151M equipment van at the radio transmitting center and R-454 separate receiving vehicles at the radio receiving center. But this cannot be done. First of all, normal functioning of all transmitting equipment is disrupted with the appearance of heavy interference on the line. Secondly, control of transmitters of the so-called mobile part of the communications center must be provided before the others. Consequently, the group method is not suitable here—it requires much time for checking and adjusting channels. Finally, a maneuver of remote control channels is precluded in this instance.

In such a situation it is advisable to act as follows. Deploy an individual radio-relay line (RRL No 1) in support of the high-power radio using equipment located directly in the transmitting and receiving vehicles. It is possible to form two voice frequency channels and two printer channels on it.

Control two medium-power transmitters over one group radio-relay line (RRL No 2). Here it is possible to obtain up to six voice frequency channels and one order line. Printer channels are formed by secondary multiplexing of one of the voice frequency channels by the corresponding equipment van.

For transmitters of the so-called main part of the communications center, plan operation over two independent group radio-relay lines (RRL Nos 3 and 4) using remote control gear available in R-454 separate receiving vehicles at the radio receiving center and in the R-151M remote control equipment van at the radio transmitting center. Using these assets, it is possible to have up to 10 voice frequency channels, up to 12 printer channels and 2 order lines.

In addition, to support the maneuver of remote control radio-relay lines it is desirable to run PTRK 5x2 cable between separate receiving vehicles at the receiving center, and at the radio transmitting center accordingly from all R-161's and R-140's to the R-151M equipment van.

In case radio-relay lines go down, one should organize the deployment of PKL 296/330-6 remote control cable lines. It is best to lay the cable from a vehicle—less time is wasted. True, there is one difficulty here, a shortage of line squad personnel. With the permission of the radio receiving and radio transmitting center chiefs, it is possible to bring in specialists of equipment vans and stations who are being freed up.

The transition from a radio-relay line to a cable line is accomplished very quickly. But here, in addition to the

corresponding very basic cross connections at the R-151VCh mode switching units, it is necessary to measure insulation resistance and loop resistance on the P-296 cable using a megohmmeter.

Experience shows that deploying remote control lines by the method described above, even with several of them damaged simultaneously, will not disturb the functioning of the entire radio center. For example, let us assume that just one group line (RRL No 3) has remained in operation. In this situation control of transmitters will be supported over the remote control line through the R-454 separate receiving vehicle and R-151M equipment van. Similarly, it is possible to get out of a difficult spot also with a particular transmitter unserviceable.

An instrument check and channel adjustment often is done by eye, as they say. Annoying interruptions in transmission of combat training information occur because of this. It is advisable to perform operations in the following sequence. Initially adjust the high-frequency channel of the radio-relay line. For this, press button "IG" on the B6 tuning unit, and with potentiometer "IG" set the necessary level of the test oscillator on the P-321M instrument. Then with potentiometer "Vkh-.per." set the instrument needle on a certain division according to the frequency table (included in the set of documentation for the R-151 VCh exciter). After this, command the radio transmitting center technician to send 800 Hz over the channel and with potentiometer "Vykh.LUS" of the B6 unit, set level "-2.6" nepers on the P-321M instrument. In performing these operations it is important to remember that in certain separate receiving vehicles the P-321M meter is graduated not in nepers, but in decibels. Then the special table of relationships given here must be used.

Level	
Db	Np
+10	+1.15
+9	+1.04
+8	+0.921
+7	+0.806
+6	+0.691
+5	.0.576
+4	+0.460
+3	+0.345
+2	+0.230
+1	+0.115
0	0
-1	-0.115
-11	-1.27
-12	-1.38
-15	-1.73
-17	-1.96
-18	-2.07
-20	-2.30
-25	-2.83
-29	-3.34
-30	-3.45
-35	-4.03
-40	-4.61
-45	-5.18
-50	-5.76

Having finished work with the high-frequency channel, go over to multiplexing it with the appropriate gear; adjust the voice frequency channels obtained and turn them over directly to the radiotelegraphers in the separate receiving vehicle.

If remote control printer channels are needed according to the diagram-order, one voice frequency channel is multiplexed by secondary multiplexing gear, adjusted, and also turned over to the radio operators for operation after first switching the operator workstation to the appropriate remote control telephone and printer channels.

When radio operators have established communications in radio nets and radio links, radio transmitting center technicians are obligated to monitor their work and ensure normal functioning of remote control channels.

The passage of a telephone conversation is monitored from instruments of the multiplexing gear. Thus, if there is work on the first channel, the first button is pressed and a deflection of the needle to the right or left is observed on the monitor. When printer communications is being conducted, the passage of printer pulses can be observed on the secondary multiplexing gear.

When the radiotelegrapher or terminal gear technician reports that a channel has dropped, the remote control technician first checks the patching cords. If they are serviceable, the PTRK 5x2 cable run to the receiving vehicle or to the terminal equipment van is rung through. If there are no disorders here as well, all gear participating in forming the channels is retested.

If everything is serviceable in this channel-forming section, the radio transmitting center technician is told to check the line from the R-151M to the transmitting vehicle. When work is going normally, the remote control technician at the radio receiving center periodically asks the transmitting vehicle technician to check the work at the exciter, at the power amplifier and at the transmitter output.

A feature of monitoring the operation of radio channels when remote control is accomplished directly from the separate receiving vehicle is the fact that the remote control technician himself can check control of transmitter oscillations on the receiver.

If specialists function according to the suggested algorithm, there can be no doubt that communicators will cope with the assigned mission.

Factors Leading to Mid-Air Collisions

95UM0194K Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 43-44

[Article by Colonel Valentin Dudin, honored military navigator, candidate of military sciences, and Colonel Aleksandr Yavtushenko, 1st class military pilot, under rubric "Flight Safety": "Mid-Air Collision: Moment of Truth"]

[FBIS Translated Text] It was the seventh and final hour of a night flight operations shift in a fighter regiment. A pair of MiG-29 fighters were executing a practice intercept of an airborne target at medium altitudes in the tactical control officer's zone of responsibility.

Lieutenant Colonel R., an experienced pilot who previously had coped repeatedly and successfully with such an assignment, was playing the role of attacker.

The situation seemed simple, and the regimental CP team and ground radar specialists monitoring the flight were acting without proper intensity. Fatigue which had built up during the night and expectation of an impending rest after a difficult shift made themselves known.

Tactical control officer Captain I. Kozlovskiy, who had neither special training nor sufficient experience in vectoring fighters, had no idea how quickly the situation in the air would change, let alone that it would develop into an emergency and even catastrophic situation.

...The interceptor was closing confidently with the target after having precisely executed a maneuver of turning to the final target heading based on the ground controlled intercept [GCI] officer's commands. In informing the attacker of the distance to the target (overstated by 3-4 km, as it later will turn out), the latter would only cast a weary glance at the screen, where the blips of the converging aircraft would flare up like little sparks with each revolution of the sweep. Then the interceptor pilot reported "launch" of the first missile, then of the second. And only when the interceptor pilot had not confirmed receipt of the breakaway command did the GCI officer clearly see that both bright returns had merged into one point on the radar screen. "Was there really a collision?" was the captain's first thought.

Alas, the terrible surmise was confirmed. The pilot of the target aircraft ejected safely, but the interceptor pilot did not succeed in saving himself...

The commission which investigated this double incident (based on the number of aircraft lost) arrived at the conclusion that the tragedy occurred due to the coincidence of a number of dangerous factors. Under the control of different services and specialists, these factors also had manifested themselves in previous flights. True, they had done so basically separately, but here they coincided. And the deciding factors among them turned out to be the interceptor's arrival at the target's altitude (although according to the mission, the attacking aircraft should have been 1,000 m lower) and the unmonitored (by the pilot and from the ground) closing with the attacked aircraft right up to the moment of collision.

Everything would appear to be clear: both the pilot as well as the intercept controller made mistakes. But is it possible to believe that the pilot's mistakes and actions were deciding? Such an assessment possibly is acceptable and even convenient for officials: the main "culprit" will no longer have anything to say in his justification. But the fact is, he was neither an airborne hooligan nor, moreover, a suicide (although that has happened in aviation practice both here and abroad). Yes, Lieutenant Colonel R. had not always acted responsibly and with discipline in the air, but shortcomings clearly told in that flight both in the methodology of executing the intercept as well as in support and control of the flight.

A thorough analysis of objective monitoring data conducted in the regiment showed that even earlier some pilots repeatedly had moved to the target aircraft's altitude in executing practice intercepts. This was an obvious violation of flight safety measures! Unfortunately, as of that moment they had not been precisely formulated in normative-methods documents in the regiment or in other Air Force units.

The equipment also let them down. It turned out that the radar weapon aiming system, the main element of the weapons aiming and navigation system, simply was out of order. In official language, the reason was difficulties in logistic support to the functioning of the aircraft's onboard equipment, but more simply stated, it was the notorious shortage of spare parts. Just why was a fighter with defective equipment permitted to fly? Well, because the pilots themselves do not always dare record shortcomings which are at first glance insignificant in the aircraft preflighting log, inasmuch as the aircraft then would be "tossed" out of the schedule and they would be left "horseless."

In such cases fighter pilots execute attacks using the thermal direction-finder, but it does not issue range to the target. The laser rangefinder can be used for this, but its use is hampered under nighttime conditions without visual visibility of the target. It remains to rely on information from the ground, but, as we see, it is not always reliable.

There also are wingtip navigation lights, which in a blinking mode (on the fighter being attacked) could at least in some way help the interceptor pilot visually detect the target and monitor the closing with it. But in order to conserve bulb life, this mode is used when taxiing on the ground and very rarely in the air.

In addition, the breakaway command, including with an indication of the optimum direction, also could have been given by the onboard weapon aiming system itself (its circuit design provides for this), but only with a

practice missile or simulator present on a hardpoint. But there were none of those in the regiment at all, and all because of that same shortage, just as there was no operating simulator on which pilots could (and were supposed to) fully rehearse many elements of piloting and combat employment, including airborne target intercepts. Spare parts also were not to be found for the simulator, which had broken down...

After the tragedy which occurred, many of those shortcomings were remedied, both in that regiment and in others. But lessons of this and similar air incidents attest that all aviation services and specialists must actively study, identify and prevent dangerous factors under their control. They must work for the pilot, and not ascribe one's own omissions to him when an emergency incident has occurred in the air. Then it will more rarely turn out that the pilot is the chief and often even the only culprit of an air mishap.

FROM THE EDITORS

According to data of the Russian Armed Forces Aviation Flight Safety Service, all accidents and crashes committed from July through November of this year are connected with the human factor (67 percent in the first half year), i.e., there continues to be a drop in professional reliability of the most vulnerable part of the "pilot-aircraft-environment" air system—the pilots, as well as flight operations support and control service specialists. Just what dictates such an alarming and dangerous trend? What steps should be taken to stop it from growing? We await competent and objective answers to these and other questions concerning flight safety from our readers, from aviators (especially of the tactical echelon) and from all interested persons.

Engineer Support in Defense of a City

95UM0194L Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 45-48

[Article by Colonel (Reserve) Vladimir Shamshurov, candidate of military sciences, docent]

[FBIS Translated Text] The fight for built-up areas has always played an important role in winning victory. The defense of small cities having only tactical importance usually would be prepared on close approaches to them and within the cities themselves, but the defensive system of large built-up areas consisted of outer zones on far and near approaches to them and inner zones to the full depth of the city. Such an area would be divided into sectors, the latter into zones, and those in turn into sections. Each section would consist of several positions based on centers of resistance. The most important principles of building a defense of cities, which proved themselves in past wars, also are applicable to a considerable extent under present conditions.

A decision to defend a city is made with consideration of the layout and building density, sturdiness and height of buildings, and nature of likely destructive damages and fires. Its basis is battalion defense areas, consisting of company and platoon strongpoints prepared for a perimeter defense (see diagram).

Sturdy corner buildings with basement and semibasement spaces, manholes of water and sewer mains, as well as remnants of demolished houses and stone fences are suitable as strongpoints. As a rule, a platoon occupies one or two structures and a company occupies several structures.

In preparing a building for defense, firing ports and embrasures for weapons are prepared first of all around the entire perimeter. Unused openings, especially on first floors, are tightly closed up with sandbags, bricks, logs, and panels of thick boards. Where possible, walls are reinforced with these same materials in those places where weapons are located.

Basement and semibasement spaces of especially sturdy buildings are prepared as dugouts and shelters. For this their overhead cover is strengthened either by additional props with stringers, reducing the length of load-bearing spans, or by pouring a thick (at least 1.5 m) layer of soil or crushed stone. Ordinary doors are replaced with protective doors. If there is to be a shelter in the basement, one or two entrance air locks are made in it and an FVA filter-ventilating unit is installed. But before basement and semibasement spaces are occupied, a check definitely is made as to whether or not they will be flooded if city water engineering structures are damaged.

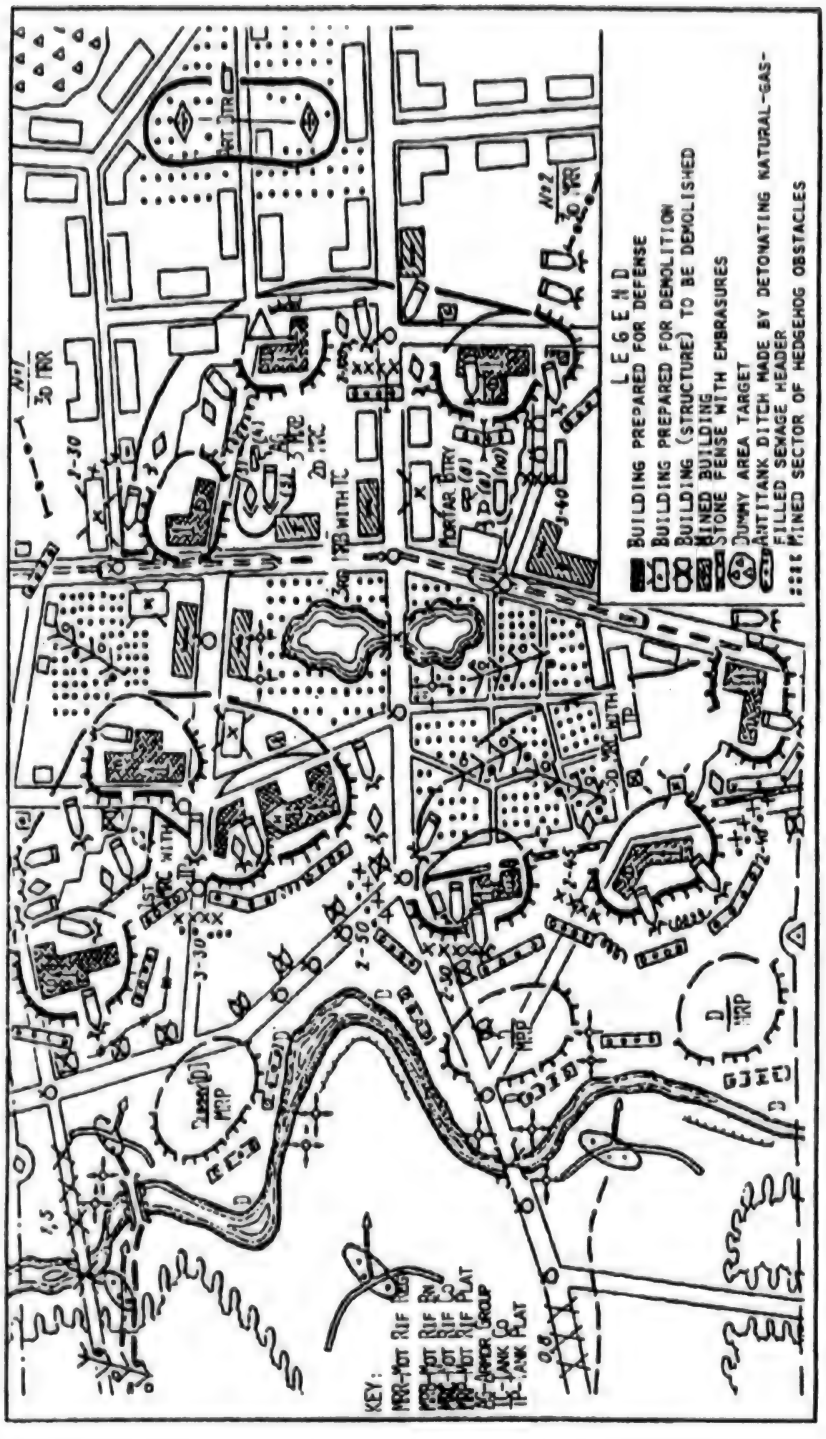
Command and control facilities, aid stations, as well as supplies are best accommodated in subway tunnels.

First-story flights of stairs and foundations of structures can be used as very basic shelters. In certain cases slabs are leaned up against remnants of walls and a layer of earth poured on.

Each building adapted for defense must have at least two exits, and on different sides. One is made in the form of a covered communication trench, which is dug outside the zone of possible structural and demolition rubble resulting from the destruction of objects situated in the vicinity. For a good field of view, approaches to the building are cleared: fences are removed, trees are felled and so on.

Forces and assets maneuver between strongpoints chiefly along underground utility lines or covered communication trenches, and attics and roofs are used in addition in areas of old construction. Breaches in walls and in floors between stories are made for passages within buildings.

Great Patriotic War experience shows that manholes of water and sewer mains and communications manholes can be used successfully to make concealed weapon emplacements. Based on the manholes, it is not difficult to prepare weapon emplacements with armored cupolas and cupolas made of reinforced concrete elements.



Engineer support to defense in a city

Under present-day conditions Gorchak type units are suitable for making weapon emplacements; in the "underground" position they are practically invulnerable—a heavy armored cover reliably protects gunner and weapon. Appearing suddenly above the surface and hitting a target in a matter of seconds (hitting a tank with an ATGM, personnel with a machinegun or grenade launcher), the gunner and weapon again "disappear underground."

Sturdy stone fences can be considered a natural position if firing ports and embrasures are punched in them and scaffolding erected for tossing grenades over the fence. Fences also become an additional protection for foxholes and trenches dug behind them.

Squad emplacements, trenches, communication trenches, and combat equipment emplacements are prepared, dugouts and shelters for the personnel's protection are built, and various ditches, levees, railroad and highway embankments, bomb craters and so on are adapted for defense when preparing strongpoints in lightly built-up city blocks and at defensive positions in front of the city.

Artillery firing positions are prepared with consideration of the layout and built-up nature of the city. Indirect firing positions are placed on the outskirts of the city, in public gardens, parks and wide inner courtyards. Emplacements are dug for the guns at that distance from high buildings which would preclude teams and combat equipment from being hit from the collapse of these structures.

Direct fire positions of pieces are prepared in semibasements, on first floors of sturdy corner buildings and behind stone fences. Small caliber pieces are positioned on second and third floors. Embrasures are made in window and door openings for conducting fire. In a number of cases a need arises to punch special embrasures in walls and fences for conducting direct flanking fire.

In the defense of a city, engineer obstacles are emplaced with consideration of the disposition of strongpoints, terrain conditions, the commander's concept the specific nature of troop operations, and the availability of personnel, equipment and time. They are tied in closely with the system of fire and with natural and artificial obstacles.

Antitank, antipersonnel and mixed minefields are emplaced, bridges and roads are demolished, and roadblocks and integrated obstacle complexes are created on city approaches and ahead of the forward edge of the first circular defensive position. Main avenues of likely tank approach on city approaches are covered by obstacles first and most densely. On these avenues it is advisable to emplace antitank and mixed minefield belts dispersed in depth and, in order to build them up in the course of battle, to use remote minelaying systems, by which minefields can be emplaced suddenly to directly bracket enemy battle, approach march and march formations. Remote minelaying systems also are used to lay mines suddenly in disposition areas of enemy subunits and on exit routes from them.

Within city limits, obstacles are erected between strongpoints on streets, intersections and squares, in parks, orchards and public gardens, on terrain sectors that are not built up, and also in city underground utility lines if they are not used for maneuver of friendly troops and if enemy actions are possible there. In essence, aboveground and underground mine warfare is conducted here.

Antivehicular mines such as the ADM-7 and MZM-2 usually are emplaced singly or in clusters of 2-3, figuring one mine per 100 running meters of street. A hole usually is punched in the road surface with a shaped charge for antivehicular mines and fougasses. If necessary, a camouflet cavity is created beneath the surface by the explosion of a concentrated charge.

The effectiveness of using horizontal effect antitank mines is especially high on city streets, where enemy tanks are forced to move alongside buildings in whose semibasement spaces (in breaches of buildings and in window and door openings) horizontal effect antitank mines may be camouflaged. They are emplaced along both sides of the street in a staggered fashion every 30-50 m.

Overhead-penetration mines emplaced behind barriers (enclosures, fences), which hampers their detection, also are effective. At the same time, they are capable of engaging combat equipment at a considerable distance from where emplaced.

To combat enemy helicopters it is advisable to create antihelicopter minefields in their probable overflight zones and at landing sites (work now is under way to create engineer munitions for such obstacles).

It is possible to use all types of antipersonnel mines in a city, but the most effective are fragmentation mines with a circular (OZM-72) and directional (MON-50) fragmentation pattern. They are laid in the form of minefields (in open areas, in sectors not built up) and in clusters or singly (on streets, in buildings, in underground structures).

The advisability of using controlled minefields in a city should be noted. This supports the maneuver of friendly troops and engagement of the enemy, which is confirmed by Great Patriotic War experience. For example, during the defense of Stalingrad 20 fascist tanks blew up on just three controlled antitank minefields laid by combat engineers of the 153rd Engineer Obstacle Battalion in the vicinity of Mechetka Ravine in September 1942.

Blast type mines and fragmentation mines are used in mining buildings. Delayed-action mines (MZD-5M, MZD-60) also find wide use. Boobytraps with pressure-release, pressure-initiated and tripwire-type action were used with success during the Great Patriotic War to mine various armament and property. In the course of local

wars and military conflicts they served for mining telephones, television and radio equipment, furniture, and items of value or generating curiosity. Fountain pens, flashlights, books, dishware and so on were used to fabricate boobytraps.

The mining of bridges, overpasses, individual multistory buildings not occupied by troops (especially in intervals between strongpoints), entrances to unused underground utilities, electric power stations, factories, large plants and other important installations is widely applicable during battle in the city. In addition, it is advisable to prepare the destruction of walls for blocking streets and alleys, to mine roadblocks and to demolish roads.

Radio-controlled mines and fougasses can be used to demolish the most important large objects. In the Great Patriotic War special mining subunits and units employed radio-controlled fougasses for remote destruction of large buildings, railroad and highway bridges, levees and other major installations. On 12 July 1941 three fougasses were detonated from a distance of around 150 km, each with a charge of 250 kg, in buildings of the city of Strugi Krasnyye. This was the first instance of combat use of radio-controlled fougasses in the world. On 13 November 1941 a building occupied by garrison commanding officer Major General von Braun and his staff was blown up in Kharkov using a radio-controlled mine. The detonation command was transmitted by a radio in Voronezh. Subsequently, radio-controlled fougasses were employed successfully by our Engineer Troops in the course of the battle on the Volga, in the Kursk Salient and others.

Electrified obstacles also are effective under city conditions. Local electric power stations and power transmission lines (including those restored for this purpose) as well as special portable troop generators are used to supply them with power. Instances of the successful use of such obstacles were noted in the Great Patriotic War for reinforcing the defense of cities of great operational importance. For example, electrical engineering battalions, part of the Engineer Troops, operated successfully in the defense of Stalingrad. Under present conditions sets of EZM modular electrified obstacles may find wide use.

Maneuver, supply and evacuation routes in the city are made along the widest streets, orchards and public gardens. Their preparation usually involves inspecting the traveled lane (and if necessary adjoining buildings) for the presence of mines, making passages in obstacles, clearing streets of rubble and collapsed structures or making crossings over them, and filling in craters. Breaches in building walls and fences may be needed in making detours of massive destructive damage.

In a number of cases foot and vehicle passages must be made through courtyards within blocks, and underground utilities (sewage headers, subways) must be adapted for the maneuver of subunits. They are cleared of mines, additionally equipped for supporting vehicular or foot passage, and marked with easily visible marker lights and signs.

Peacemaker-94 Russian-American Exercise at Totskoye

95UM0194M Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 50-51

[Article by Captain Artur Gulko, exercise participant, under rubric "Peacemaker-94": "First Experience"]

[FBIS Translated Text] *"Atlantida" blazed with the fire of civil war. Coalition peacemaking forces entered the country under UN mandate. Peacemaking soldiers of Russia and America had to act in a complicated and often changing situation at Totskoye Range...*

The Ural vehicle, which obviously had gone through a great deal, stopped at the inspection area after turning sharply between the slabs of the enclosure. The two passengers who clambered from the cab clearly were nervous. Lieutenant Sergey Lebedev, senior person at the joint checkpoint, decided to inspect the vehicle. His suspicions were aroused immediately—an army model of a radio was in the vehicle body—and shifted to certitude when he discovered an assault rifle beneath the driver's seat and ammunition behind the instrument panel. In the course of further inspection, another four "barrels" and cartridges for them were removed from the vehicle, intended, as it turned out, for Brown units...

Sergeant Michael Futekk [as transliterated] was in charge of the personal search of the driver and passengers. At first the Americans were very well-wishing. They practically did not guard the unidentified persons until the first evidence was found, but the persons immediately came under the sights of M-16's as soon as the slightest doubts arose. Everything developed futher according to plan: detainees interrogated; civilian authorities summoned for turning over weapons, equipment and people; and other measures according to the exercise concept.

U.S. Army 3rd Infantry Division Commander Brigadier General L. Holder, Jr. explained that rehearsing all episodes produces enormous benefit: "We of course already have taken part in peacemaking operations, but the Russian colleagues are unsurpassed in certain matters. We especially liked the work of joint checkpoints. Russian soldiers take a very serious attitude toward ensuring personal safety. We will arm ourselves with their experience—there is no place for unconcern in a combat situation!"

...A mobile patrol discovered the Green armed camp. A support team in three HMMWV's moved out from U.S. Checkpoint Alfa under the command of First Lieutenant Bruce Kimery. The Greens opened up surprise fire on noticing the peacemakers' vehicles.

But there was silence in response. Only one and a half minutes later did heavy-caliber machineguns riddle the dense undergrowth of the grove that harbored the camp. Dismounting, Kimery's team went deep into the thickets

to neutralize the terrorists. The soldiers went in a skirmish line, talking loudly among themselves. And although the assigned mission was performed as a result of combing the terrain, Senior Lieutenant Dmitriy Baranov, commander of the Green scenario execution team, assessed the Americans' actions as follows: "In a real situation I would have killed them all. They were walking at full height as if on parade. And where? In a forest in which terrorists who had fired on them had hidden!"

After arriving at the spot, C Company Commander Captain Mark Shankle immediately imposed order: the saboteurs were unceremoniously laid on the ground, hands behind their heads, legs crossed, and the barrels of assault rifles were put against the backs of their heads. After a thorough search, the detainees were placed on their knees in the body of the truck they had abandoned and were sent off to brigade headquarters for interrogation. Soldiers who were scolded for heedlessness drew themselves up, commands became precise, and no one shouted any longer so the entire forest could hear him or poked out of the bushes like a range target. The military chaplain arrived a bit later to perform a ceremony over the "killed" terrorist and to chat with the prisoners—"They are people too." Then the support team returned to Checkpoint Alfa, from where a report had come about the approach of a crowd of "refugees"...

Platoon Commander First Lieutenant Kimery:

"This exercise is the biggest event in the history of our armies. I chatted with officers who had taken part in events in Moldova, Abkhazia, Ossetia and Tajikistan. We can learn something from them."

...The refugees had been forced to abandon a village which had become an arena of military operations. For three days now they had been moving toward the capital, the city of Atlantis, hoping to receive refuge there. Not far from Checkpoint Alfa they had been fired on and it appeared the end was inevitable, but help was not long in coming. American medical personnel examined the unfortunate wretches and the GI's prepared dry rations for them—the people had not eaten for two days. You are safe, explained an interpreter. At odd moments and very unobtrusively he would pump the refugees about the situation in the area: Just where had they seen armed groupings, with what kind of weapons had they been fired on and by which side, where was the village and what was happening there?..

27th Guards Division Commander Major General A. Sidyakin:

"The Americans have worked together more than once with armies of other countries in the process of conducting joint peacemaking operations, but we had not experienced such a thing up until today. But now we can boldly declare that we are capable of taking part in them. We tested in practice the theory put into the "Rukovodstvo po taktike deystviy mirotvorcheskikh sil" [Manual on Operating Tactics of Peacemaking Forces]. Based on exercise results, we will make necessary changes and additions to it, and it essentially will become the first textbook for our armies."

...A patrol HMMWV "blew up" on a minefield. While the summoned support team determined its boundaries and combed the terrain, a vehicle drove up to transport "wounded." Two servicemen were given emergency assistance right on the spot: tourniquets were applied, antishock drugs administered and a field IV set was set up. The medics' actions could not help but generate admiration—not one extra movement, not one missed second.

The well-conceived nature of gear also was striking. Thus, doors are removed from an ordinary patrol jeep for convenience of carrying victims from it. It is possible to determine blood group and contraindications for medical drugs from special sewn-on patches. Plastic packaging has everything necessary for giving emergency assistance. The medical carrier is designed to transport five persons in two tiers. Raising stretchers to the second "story" requires no special effort and is done by a system of levers with which one person fully copes...

The "Peacemaker-94" Program abounded in surprise situations, but Russian and American soldiers successfully coped with them, demonstrating supreme professionalism and a desire for cooperation. This was noted by Russian Federation Minister of Defense General of the Army P. Grachev, who visited the exercise area:

"The exercise was successful. I am firmly convinced that the more often our armies have contact, the firmer peace will be.

"The 27th Guards and 3rd Infantry divisions became pioneers in expanding military cooperation between our countries, but we are ready to broaden contacts. Next year a battalion exercise is planned on the very same topic, this time on U.S. territory.

"For a long time we saw each other as enemies, but this is not so. Back in 1945 the Elbe showed that together it is possible to cope even with fascism."

EQUIPMENT AND ARMAMENT

MiG-29 Organizational Maintenance

95UM0194N Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 60-61

[Article by Lieutenant Colonel Viktor Gorshkov, candidate of technical sciences, and Vladimir Kovalev, candidate of technical sciences]

[FBIS Translated Text] **As we know, the number of aircraft repair enterprises now has been reduced considerably. The importance of organizational maintenance of combat aircraft has grown in this connection. The authors of this article tell about certain technological features of performing it on the MiG-29 fighter.**

The MiG-29 fighter has been operated in air units for a rather long time, during which a number of technological features of its maintenance have been identified. Under troop conditions maintenance is performed by personnel of aviation technical detachment servicing crews, aircraft maintenance unit specialists and unit aircraft repair shop specialists. Its performance presumes the fulfillment of a number of general technological operations that are mandatory not just for this aircraft.

Thus, after an aircraft arrives in the maintenance subunit it is thoroughly inspected to identify visible cracks, worn-through places, deformed structural members, and corrosion damage. Special attention is given here to the condition of nipple connections, the size of attachment holes, and the conformity of clearances, excesses and mismatches of control surfaces, ailerons and flaps to basic outlines. Flight equipment as well as individual assemblies and hardware are removed from the aircraft and cleaned and washed before flaw detection.

Results of an in-depth optical-visual and instrumental inspection of the aircraft's technical condition are the basis for choosing the method of remedying malfunctions and figuring the personnel and assets needed for this. The nomenclature of hardware, parts and elements of the airframe structure needing replacement or restoration of working capacity is determined in this same stage.

Repeat use of fuel and hydraulic system lines in which mechanical damages were detected, especially in a nipple connection, is not permitted on the MiG-29. Hoses that have lost elasticity and seal elements having a limited calendar service life are subject to mandatory replacement.

Machining of structural materials, riveting, welding, soldering and gluing are widely used to restore working capacity of parts, hardware and assemblies in MiG-29 operational maintenance practice. Bench and machining operations are used basically to remove scores, nicks, scratches, and erosion and corrosion failures, and to install patches, inserts and sections with an insignificant amount of bending.

Damages to the MiG-29 airframe skin and primary structure are remedied during organizational maintenance basically by riveting. A feature of its performance is the need for strict preservation of surface quality and precision of outlines of the fuselage, wing, dorsal fin, engine nacelle and so on. Thus, countersunk rivet heads must not protrude from seats by more than 0.2 mm. The aircraft is not permitted to operate when scratches more than 0.15 mm deep are present on the skin of the wing and center section and on the airtight part of the fuselage. Special attention should be given to selecting rivets. The material of which they are made must be close in characteristics to the material of parts being connected and must have an identical linear expansion coefficient. In addition, it should not form voltaic couples with the parts and at the same time should possess high anticorrosive properties.

Structural members and rivets to be replaced must be removed in such a way as not to disturb the strength of the section. Avoid forming acute angles and stress concentrators when cutting or sawing out damaged sections in ribs, stringers and formers. After a thorough fitting, new structural members made of the very same materials are put in place of those removed. Minor damages and cracks are filled in by welding or soldering. Conditions are chosen depending on the grade and thickness of material and considering features of the assembly being repaired.

Experience has shown that during MiG-29 organizational maintenance there is not always an opportunity to replace the covering of the radio-transparent cone, of the vertical tail and also of tips of the vertical tail, wing and nose flap. In this case repair is accomplished basically by installing patches, and glue is forced into nonglued places and delaminations. Dents in duralumin skin (area up to 100 cm^2, depth to 1 cm, no more than three per square meter), small punctures in its nonload-bearing sections, and clearances in joints of outer sheets are filled in with a paste made on the basis of expoxide resin.

The entire set of work and operations performed during operational maintenance on the MiG-29 airframe is fully supported by the PARM-2DM(PM) bench and machining group of shops from the makeup of mobile inspection and maintenance equipment.

Despite the fact that technical documentation on MiG-29 hardware and assemblies provides for a certain simplification of requirements for them for organizational maintenance, quality control of work performance remains one of the most important elements of the process of restoring the aircraft airframe. It is done both for individual operations as well as after performance of the full set of work. Special attention here is given to a check of the precision and completeness of performance of technological operations, correctness of installation of hardware and onboard electrical circuits, and the condition of protective coatings.

The repaired aircraft is subjected to tests during which weight and leveling characteristics are determined and the correctness of adjustments is verified. During ground tests a check is made only of those assemblies and hardware which were repaired. A decision on the need to conduct flight tests is made by the deputy unit (formation) commander for aviation engineering service. Results of ground and flight tests are reflected without fail in maintenance logs or in certificates appended to them.

An entry is made in the aircraft preflighting log on repair performed on hardware and systems, with a mandatory indication of restrictions on time periods of flight operation.

MiG-29, Su-27 Ekran Monitoring and Crew Warning System

95UM0194O Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 62-63

[Article by Lieutenant Colonel Sergey Petrichenko, candidate of technical sciences, and Russian Army employee Vladimir Mikhaylov: "Is Ekran' Truthful?"]

[FBIS Translated Text] *The list of measures for servicing the Ekran system, regulated in plant instructions, does not take full account of certain nuances identified in the course of its operation in military units. The authors of this article generalize experience accumulated by aviation engineering service specialists over a lengthy time and focus attention on some of Ekran's features.*

The Ekran onboard built-in monitoring and crew warning system equips MiG-29 and Su-27 aircraft. This is a qualitatively new piece of equipment that combines into a unified information complex the functions of built-in systems for monitoring individual onboard subsystems. Ekran harmoniously supplements the Tester gear, the voice informer, and in-cockpit signaling system widely known in the Air Force. The new system's principal merit is the possibility of monitoring the technical condition of onboard gear promptly and in an easily understood form when it is checked by servicing personnel on the ground. In addition, and this is especially important, it informs the aircraft crew in the air about an emergency functioning mode of all monitored systems and about their failure.

System gear consists of a logic and monitor-modes-control unit and a universal data display annunciator panel. When checks are being made on the ground, Ekran forms special test signals and uses them to interrogate all onboard electronic devices according to a special algorithm, after which it analyzes data coming from them. In flight the system interrogates the gear according to the very same scheme, but continuously, and after analysis of quick-look data it produces a textual report on the pilot's instrument panel display. At the same time, such reports are recorded in the emergency recording system, which permits promptly analyzing reasons for an aircraft crash, for example. Ekran has a data bank of 256 previously formulated reports, which takes in the majority of familiar situations connected with onboard equipment failures in the MiG-29 and Su-27.

Experience of operating Ekran showed that its technical servicing and restoration have no specific features compared with other modern electronic equipment, but use of the principle of issuing standard reports and the presence of a limited (albeit large) number of them sometimes causes certain difficulties for servicing personnel.

First of all, it is possible for false reports to appear, caused by the slightest interference in the electrical circuit of the Ekran system itself or in aircraft circuits connected with it. Secondly, it is possible to have an inadequate display of a particular situation in monitored aircraft systems in connection with the limited nature of the set of reports in Ekran memory.

In the initial period of operation of the built-in monitoring system, servicing personnel often encountered the appearance of false reports dictated by random electrical interference in communication lines, which might generate a contemptuous attitude in some "users" toward individual reports on the display or the recording tape. The Ekran system presently has been modernized in all aircraft, and false reports which arose for the first reason essentially have been eliminated.

Nevertheless, opponents may object that there sometimes are reports which find no direct confirmation with a check by other monitoring equipment. As a rule, such instances relate to manifestations specifically of the second problem, connected with use of a limited bank of standard reports in the Ekran system, and so require technical personnel's serious analysis of the reasons for their appearance.

Here are a few examples from the experience of operating Su-27 aircraft. Operation of the hydraulic pump and line assembly was disrupted after takeoff and retraction of landing gear. Thanks to the timely appearance on the Ekran information display of the reports "AVTOM-.VOZD.PRAV." [as transliterated; exact meaning of reports in this paragraph uncertain] and "REZ-ERV.BOK KANALA", and 30 seconds later "GIDRO NA UPRAVLEN.", which indicated a drop in pressure and sharp reduction in fluid reserve in the hydraulic system, the pilot managed to abort the flight and land the aircraft. Subsequent analysis of reports recorded on the film showed that the signals "AVTOMAT.VOZD.ZA-B.PRAV." and "ODNA GIDRO" appeared on the information display back during preflight engine runup and were ignored both by the pilot and the technician in the belief they were false. Timely remedying of the troubles could have prevented disruption of a flight mission.

In another situation the Ekran system issued the information "SBROS OBOROTY DVIGATELYA" [drop in engine rpm] in the course of several flights. Sometimes the report was accompanied by the brief signal "VOZD.-ZAB.ZAKRYT" [air intake closed], which was taken to be a certain delay in protective devices opening after the aircraft reached the prescribed speed. A superficial check of causes for the report by technical personnel gave grounds to consider it false, and so the pilot ignored this information in each subsequent flight. As a result, engine shutdown occurred in the air. A more detailed analysis identified a disruption in the order of operation of protective devices—their late opening in the takeoff phase.

The examples cited attest to the fact that one should be more attentive toward any report and interpret it as

trouble not yet detected, not as the surprise of a "capricious woman"—modern electronics. In all cases that are vague or which have not previously been encountered, it is necessary to use other available monitoring and recording equipment. It is advisable for each air unit to set up a data bank on all instances of failures reported by the Ekran system and the indirect causes of their appearance. All this will permit substantially reducing the duration and labor-intensiveness of troubleshooting and will facilitate rapid, quality mastery of aircraft equipment by young specialists.

SCIENCE. TECHNOLOGY. PROGRESS

S-300 PMU-1 (SA-10B) SAM System

95UM0194P Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) pp 67-69

[Article by Yevgeniy Ivanovich Nikiforov, deputy chief designer of Almaz Scientific Production Association: "Sky Under Cover of Almaz"]

[FBIS Translated Text] **Use of the Patriot SAM system by U.S. troops during the Persian Gulf war caused a sensation in the world. Television reports about the system's operation against Iraqi SCUD missiles were very spectacular and could serve fully as the foundation for positive epithets about this weapon. But the following questions also are substantiated: "But are these raptures that correct?" and "Are there such weapons in the Russian Army inventory?" We asked Yevgeniy Ivanovich Nikiforov, deputy chief designer of Almaz Scientific Production Association, to answer them.**

The U.S. Patriot SAM system is a rather modern weapon: it was developed in the mid-1980's. Its modernization had been completed by the moment combat operations in the Persian Gulf began, and as a result Patriot acquired the capability of engaging tactical and operational-tactical ballistic missiles. But this system did not knock down Iraqi SCUD's that effectively. Judge for yourself: destroying one SCUD missile (the intercept was only of lone missiles—one or two a day) that did not have modern active countermeasures equipment required an unjustifiably large number of guided missiles. So in answering the first question it can be said that there are not that many grounds for raptures about the Patriot heard in the foreign information media.

Do we have such weapons? We do, and they surpass the American ones in many parameters and are not inferior to them in some. This is the S-300 PMU SAM system. Its creators managed to successfully solve a multitude of scientific and engineering problems and to take full account of today's requirements and provide a large potential for further upgrading. The very first firings after the S-300 PMU became operational revealed its high effectiveness. The following example is indicative: in firing against four missiles similar to the U.S. Lance, all were hit and two fell 7-8 km from the point at which they were aimed. Thus, designers managed to ensure the deviation of a hit missile from its course such that neither its impact as a heavy body nor the detonation of its charge presents a danger to the defended installation.

The S-300 PMU system is capable of engaging aircraft and cruise missiles at all of their combat employment altitudes beginning from 25 m (Patriot from 60 m). In addition, this system is mobile and requires only 5 minutes (Patriot 30 minutes) to transfer from a traveling to a deployed configuration.

Main Characteristics of 83M6Ye Control Equipment

Target acquisition range, km	Up to 300
Maximum target tracking speed, km/hr	Up to 10,000
Deployment time, min	5
Size of combat team	6

Creation of the S-300 PMU-1 SAM system (foreign designation SA-10B) was the result of this system's further upgrading. It was shown for the first time at the Zhukovskiy Mosaeroshou-92 Exhibition, where it received a very high assessment from specialists, although it was demonstrated only in the combat team practice mode. But at the IDEX-93 Exhibition in Abu Dhabi (United Arab Emirates), demonstration firings against two cruise missiles were conducted for the first time at the Maqatra range. The result was stunning: two missiles hit the targets and another two destroyed their falling fragments.

Just what is this weapon?

The S300 PMU-1 mobile, multichannel SAM system is intended for defending military and industrial installations against massed strikes of offensive air weapons and for establishing the country's air defense lines. It supports the engagement both of modern as well as of future aircraft of all types, cruise missiles, ballistic targets and others flying at altitudes from 10 m to their combat employment service ceiling under conditions of intensive countermeasures.

The system is a further development of the S-300 PMU SAM system from the standpoint of an improvement in the latter's specifications and performance characteristics. This improvement was achieved because of the introduction of new engineering solutions developed based on its many years of operating experience and also an upgrading of software using high-performance computers. This permitted increasing the range of engaging aerodynamic targets, increasing the effectiveness of engaging ballistic missiles and expanding the range of

speeds of engaged targets. In addition, the system became more autonomous through a substantial expansion in the sectors of space searched. The capabilities for rehearsing combat work techniques using a simulator system also managed to be augmented substantially.

The S-300 PMU-1 includes 83M6Ye control equipment accommodated on a MAZ-543M four-axle chassis with good off-road capability, and the SAM system.

The control equipment is versatile and adapted especially for controlling groupings of both S-300 PMU-1 and SU-300 PMU as well as S-200 DE and S-200 VE systems, with up to 6 systems overall in the grouping. The 83M6Ye is made up of the 54K6Ye command post [CP] and 64N6Ye acquisition radar. Control is accomplished based on its own radar data and data from the controlled systems, and also based on data from control equipment of adjacent groupings and from higher level equipment. Two versions of the 83M6Ye design have been realized: mobile, with the CP and acquisition radar accommodated on motor vehicle chassis; and a transport-container, with the CP and equipment part of the acquisition radar accommodated in shelters at fixed positions.

The 54K6Ye CP in the grouping of controlled systems supports accomplishment of the following missions in an automatic mode: control of acquisition radar scan modes; initial engagement, identification, and tracking of up to 100 target tracks; determination of their state affiliation; selection of top priority targets to be engaged and their distribution among controlled systems with the issue of target designations; support of interworking of systems in a difficult jamming situation; coordination of the systems' autonomous combat operations; support of interworking with adjacent and higher control equipment.

The CP equipment container accommodates operator workstations, the multiprocessor computer system, communications gear and gear for documenting combat operations. There is developed software and hardware for combat team practice both in an autonomous as well as in an integrated mode of functioning of control equipment.

The 64N6Ye acquisition radar is intended for acquisition and tracking of targets. It consists of an antenna station that rotates in azimuth and a stationary equipment container accommodated on a common multiple truck-trailer rig. It supports acquisition and change of target coordinates with necessary accuracy and determination of the targets' state affiliation under the effect of natural and deliberate interference.

The antenna device is made on a phased array basis with two-sided use of the aperture. The space is scanned with the circular rotation of the antenna station (one revolution in 12 seconds) combined with electronic control of the antenna beam in azimuth and elevation. There also are provisions for scanning sectors of space for acquiring operational-tactical and ballistic missiles.

The SAM system includes a multifunction illuminating and guidance radar and eight self-propelled launchers. The self-propelled launchers are manufactured in two modifications: 5P85TYe, a semitrailer on the triple-axle KrAZ-260 vehicle, and 5P85SYe on the four-axle MAZ-547. The SAM system has a short reaction time, a high degree of automation of combat work processes and a high rate of fire. It can fire simultaneously on up to six targets with up to two missiles guided to each. System equipment can be deployed in 5 minutes without preliminary preparation of the position.

The multifunction illuminating and guidance radar includes an antenna station and equipment container mounted on a common wheeled chassis. It supports the search and lockon of targets for automatic tracking, and guidance of missiles to them, including under intensive ECM conditions. The antenna device consists of phased arrays with digital control of beam position. The antenna station can be placed on a special mobile tower to increase the range of acquisition and fire on extremely low altitude targets and also when deploying the SAM system on forested or very rugged terrain. The equipment container accommodates operator workstations, a multiprocessor computer and built-in functional monitoring gear. Comfortable working conditions necessary for conducting around-the-clock alert duty are provided. The illuminating and guidance radar and self-propelled launcher are equipped with autonomous power supply sources and radio communications.

Main Characteristics of S-300 PMU-1 SAM System

Target engagement range, km:	
aerodynamic	Up to 150
ballistic	Up to 40*
Target engagement altitude, m:	
minimum	Up to 10
maximum	Aircraft combat employment service ceiling
Speed of engaged targets, km/hr	Up to 10,000*
Number of targets fired on simultaneously	Up to 6
Number of missiles guided simultaneously	Up to 12
Rate of fire, sec	3
Deployment time in mobile version, min	5
Number of missiles in system	Up to 32

*Based on target designation

The self-propelled launcher provides transportation, storage and launch of the missile and carries four transporter-launchers. The 48N6Ye is a single-stage, solid-propellant missile fitted with a radar proximity fuze and heavy (140 kg) fragmentation warhead. The launch is vertical and is made by ejecting the missile from the transporter-launcher, with subsequent ignition of the propulsion stage. These features permit firing on targets flying from any direction without turning the self-propelled launcher.

The principle of tracking a target through the missile is used in guiding the missile, where control commands are produced based on data from the illuminating and guidance radar and onboard direction finder.

In autonomous combat operations the SAM system performs detection of targets in autonomous search sectors and also can receive target designations from the attached 36D6 all-altitude 3-D surveillance radar.

Based on Army specialists' responses, the S-300 PMU-1 SAM system quickly took root in the troops and fully suits combat teams. With high combat effectiveness, it also does not require great efforts from personnel during deployment and take-down. The built-in gear for monitoring the functioning of systems and the multiprocessor computer permit teams to be constantly sure that their weapons harbor no hidden malfunctions. Missiles supplied in transport-launch containers require no checks or adjustments for almost ten years.

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[FBIS Translated Text]

Articles Not Translated From ARMEYSKIY SBORNIK No 6, December 1994

00000000 Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94) p 1

Publication Data

95UM0194S Moscow ARMEYSKIY SBORNIK in Russian No 6, Dec 94 (signed to press 29 Nov 94)

[FBIS Translated Text] English title: ARMY DIGEST

Russian title: ARMEYSKIY SBORNIK

Editor: V. P. Vinnik

Publishing house: Izdatelstvo "Krasnaya zvezda"

Place of publication: Moscow

Date of publication: December 1994

Signed to press: 29 November 199

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13 April 95